UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

MAR - 7 2007

CERTIFIED MAIL -
RETURN RECEIPT REQUESTED

Mr. Stephen Halasz, Environmental Department Manager
Kleinfelder
3601 Manor Road
Austin, TX 78723

Re: Approval With Modifications
Second Amended Draft Remedial Investigation and Feasibility Study Work Plan
Second Amended Draft Field Sampling Plan and Quality Assurance Project Plan
EPA's Comments on Second Amended Draft Deliverables Dated July 7, 2006
Falcon Refinery Superfund Site; Ingleside, San Patricio County, Texas

Dear Mr. Halasz:

The United States Environmental Protection Agency (EPA) has completed the review of the "Second Amended Draft Remedial Investigation and Feasibility Study (RI/FS) Work Plan" (WP), "Second Amended Draft RI/FS Field Sampling Plan" (FSP), and "Second Amended Draft RI/FS Quality Assurance Project Plan" (QAPP); each dated July 7, 2006. These second amended draft deliverables were submitted by National Oil Recovery Corporation (NORCO) pursuant to the "Administrative Order on Consent (AOC) for Remedial Investigation and Feasibility Study," effective June 9, 2004; for the Falcon Refinery Superfund Site, Ingleside, San Patricio County, Texas; and constitute the third round of draft submittals. The Quality Management Plan (August 5, 2005), submitted in December 2006 pursuant to the AOC, was approved on January 3, 2007.

In accordance with Section IX. (Work to be Performed), Paragraph 31(b) of the AOC, this letter and enclosure constitute an approval of the second amended draft deliverables, but with required modifications. Section 31(b) provides that "EPA may . . . (b) approve the submission but require modifications, which may include deletions or additions prepared by EPA, which NORCO must incorporate into the text of the submission as directed by EPA in writing." Enclosure A (Approval With Modifications, EPA's Comments on Second Amended Draft Deliverables Dated July 7, 2006) consists of the EPA's comments on the deliverables and are submitted pursuant to the AOC. The EPA's comments include the comments provided by the Texas Commission on Environmental Quality and the Federal and State Natural Resource Trustees.

Upon receipt of the draft deliverables, with the incorporation of the EPA's modifications, the EPA will review the draft deliverables and notify NORCO, in writing, of approval or disapproval. NORCO can proceed with the RI/FS for the Site when the EPA's required modifications have been incorporated and the deliverables have been fully approved by the EPA.

In accordance with Section IX., Paragraph 33 of the AOC, upon "receipt of notice of . . . approval with modifications, . . . NORCO must correct the deficiencies and resubmit the submission for approval." NORCO is therefore required to correct the Second Amended Draft RI/FS WP, FSP, and QAPP and resubmit each deliverable after incorporating the EPA's comments exactly as directed in Enclosure A. Specifically, NORCO is directed to resubmit each deliverable after incorporating the EPA's modifications "exactly" as directed in the comments provided in Enclosure A, as well as the EPA's written comments dated February 3, 2005; March 23, 2005 (Addendum to the EPA's 2/03/05 Comments on NORCO's 9/07/04 Draft Deliverables); and March 1, 2006; concerning NORCO's Draft WP, FSP, and QAPP. NORCO should also consider the EPA's verbal comments provided during the initial "scoping meeting" held on July 7, 2004, and the scoping meeting held on April 13, 2006. Further, Paragraph 34 states that if, on resubmission by NORCO, the EPA disapproves the Draft Final RI/FS WP, FSP, and QAPP, stipulated penalties will begin to accrue as of the date of the EPA's notice of disapproval.

Please call me, at (214) 665-7437, to discuss the due date for submittal of the draft final deliverables and to discuss any questions or comments you may have concerning this letter or the EPA's comments included in Enclosure A.

Sincerely yours,

Rafael A. Casanova

Rafael A. Casanova, P.G. (Remedial Project Manager)
Superfund Division

Enclosure

cc: Mr. Richard Bergner (National Oil Recovery Corporation)
Ms. Gloria Moran (U.S. Environmental Protection Agency, Region 6)
Ms. Anna Milburn (U.S. Environmental Protection Agency, Region 6)
Mr. Kenneth Shewmake (U.S. Environmental Protection Agency, Region 6)
Mr. Phil Turner (U.S. Environmental Protection Agency, Region 6)
Mr. Gary Moore (U.S. Environmental Protection Agency, Region 6)
Ms. Jessica White (U.S. National Oceanic and Atmospheric Administration)
Mr. Barry Forsythe (U.S. Fish and Wildlife Service)
Ms. Tammy Ash (U.S. Fish and Wildlife Service)
Mr. Phillip Winsor (Texas Commission on Environmental Quality)
Mr. Richard Seiler (Texas Commission on Environmental Quality)
Ms. Vickie Reat (Texas Commission on Environmental Quality)
Mr. Jeff Patterson (Texas Commission on Environmental Quality)
Mr. John Wilder (Texas Commission on Environmental Quality)
Mr. Don Pitts (Texas Parks and Wildlife Service)
Mr. Keith Tischler (Texas General Land Office)

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In accordance with Section IX. (Work to be Performed), Paragraph 31(b) of the AOC, this letter and enclosure constitute an approval of the second amended draft deliverables, but with required modifications. Section 31(b) provides that "EPA may . . . (b) approve the submission but require modifications, which may include deletions or additions prepared by EPA, which NORCO must incorporate into the text of the submission as directed by EPA in writing." Enclosure A (Approval With Modifications, EPA's Comments on Second Amended Draft Deliverables Dated July 7, 2006) consists of the EPA's comments on the deliverables and are submitted pursuant to the AOC. The EPA's comments include the comments provided by the Texas Commission on Environmental Quality and the Federal and State Natural Resource Trustees.

Upon receipt of the draft deliverables, with the incorporation of the EPA's modifications, the EPA will review the draft deliverables and notify NORCO, in writing, of approval or disapproval. NORCO can proceed with the RI/FS for the Site when the EPA's required modifications have been incorporated and the deliverables have been fully approved by the EPA.

for 3-7-07
CASANOVA/rc/030507/FILE:a:falcon_epa_comments_amended_deliverables_030507.wpd
RIBB MORAN
6SF-RA 6RC-SM
3/7/07 3/7/07 for Chauvin 6SF-RA 3/7/07
3/7/07

In accordance with Section IX., Paragraph 33 of the AOC, upon "receipt of notice of . . . approval with modifications, . . . NORCO must correct the deficiencies and resubmit the submission for approval." NORCO is therefore required to correct the Second Amended Draft RI/FS WP, FSP, and QAPP and resubmit each deliverable after incorporating the EPA's comments exactly as directed in Enclosure A. Specifically, NORCO is directed to resubmit each deliverable after incorporating the EPA's modifications "exactly" as directed in the comments provided in Enclosure A, as well as the EPA's written comments dated February 3, 2005; March 23, 2005 (Addendum to the EPA's 2/03/05 Comments on NORCO's 9/07/04 Draft Deliverables); and March 1, 2006; concerning NORCO's Draft WP, FSP, and QAPP. NORCO should also consider the EPA's verbal comments provided during the initial "scoping meeting" held on July 7, 2004, and the scoping meeting held on April 13, 2006. Further, Paragraph 34 states that if, on resubmission by NORCO, the EPA disapproves the Draft Final RI/FS WP, FSP, and QAPP, stipulated penalties will begin to accrue as of the date of the EPA's notice of disapproval.

Please call me, at (214) 665-7437, to discuss the due date for submittal of the draft final deliverables and to discuss any questions or comments you may have concerning this letter or the EPA's comments included in Enclosure A.

Sincerely yours,

Rafael A. Casanova, P.G. (Remedial Project Manager)
Superfund Division

Enclosure

cc: Mr. Richard Bergner (National Oil Recovery Corporation)
Ms. Gloria Moran (U.S. Environmental Protection Agency, Region 6)
Ms. Anna Milburn (U.S. Environmental Protection Agency, Region 6)
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Mr. Jeff Patterson (Texas Commission on Environmental Quality)
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Mr. Don Pitts (Texas Parks and Wildlife Service)
Mr. Keith Tischler (Texas General Land Office)

ENCLOSURE A
APPROVAL WITH MODIFICATIONS
EPA'S COMMENTS ON SECOND AMENDED DRAFT DELIVERABLES
DATED JULY 7, 2006
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

SECOND AMENDED DRAFT WORK PLAN, FIELD SAMPLING PLAN, AND QUALITY ASSURANCE PROJECT PLAN

FALCON REFINERY SUPERFUND SITE
INGLESIDE, SAN PATRICIO COUNTY, TEXAS
March 2007

The U.S. Environmental Protection Agency (EPA, Region 6) has performed a technical review of the "Second Amended Draft Remedial Investigation and Feasibility Study (RI/FS) Work Plan" (Second Amended Draft WP), "Second Amended Draft RI/FS Field Sampling Plan" (Second Amended Draft FSP), and "Second Amended Draft RI/FS Quality Assurance Project Plan" (Second Amended Draft QAPP), each dated July 7, 2006. The second amended draft deliverables constitute the third round of draft submittals. This Enclosure A (Approval In Part With Modifications, EPA's Comments on Second Amended Draft Deliverables Dated July 7, 2006) consists of the EPA's comments on each amended draft deliverable. These deliverables were submitted by National Oil Recovery Corporation (NORCO) pursuant to the "Administrative Order on Consent (AOC) for Remedial Investigation and Feasibility Study," effective June 9, 2004, for the Falcon Refinery Superfund Site (hereinafter "the Site").

The EPA's comments included in Enclosure A are being submitted pursuant to the AOC and are not inconsistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), National Oil and Hazardous Substances Pollution Contingency Plan (NCP), AOC for RI/FS, and Superfund RI/FS guidance and policies. The EPA's comments also consist of and consider the comments provided by the Texas Commission on Environmental Quality (TCEQ) and the Federal and State Natural Resource Trustees. The EPA has no comments on the Draft Safety and Health Plan. The Quality Management Plan (August 5, 2005), submitted in December 2006, was approved on January 3, 2007.

As provided in Section IX. (Work to be Performed), Paragraph 31(b) of the AOC, the EPA's letter and this enclosure constitute an approval of the second amended draft deliverables, but with required modifications. That is, the EPA approves the Second Amended Draft RI/FS WP, FSP, and QAPP (each dated July 7, 2006), but with modifications which NORCO must incorporate into the text of the deliverables as directed by the EPA in this Enclosure A. Upon receipt of the draft deliverables, with the incorporation of the EPA's modifications, the EPA will review the draft deliverables and notify NORCO, in writing, of approval or disapproval. NORCO can proceed with the RI/FS for the Site when the EPA's required modifications have been incorporated and the deliverables have been fully approved by the EPA.

In accordance with Section IX., Paragraph 33 of the AOC, upon "receipt of notice of . . . approval with modifications, . . . NORCO must correct the deficiencies and resubmit the submission for approval." NORCO is therefore required to correct the Second Amended Draft RI/FS WP, FSP, and QAPP and resubmit each deliverable after incorporating the EPA's comments exactly as directed in Enclosure A. Specifically, NORCO is directed to resubmit each deliverable after incorporating the EPA's modifications "exactly" as directed in the comments provided in Enclosure A, as well as the EPA's written comments dated February 3, 2005; March 23, 2005 (Addendum to the EPA's 2/03/05 Comments on NORCO's 9/07/04 Draft Deliverables); and March 1, 2006; concerning NORCO's Draft WP, FSP, and QAPP. NORCO should also consider the EPA's verbal comments provided during the initial "scoping meeting" held on July 7, 2004, and the scoping meeting held on April 13, 2006. Further, Paragraph 34 states that if, on resubmission by NORCO, the EPA disapproves the Draft Final RI/FS WP, FSP, and QAPP, stipulated penalties will begin to accrue as of the date of the EPA's notice of disapproval.

Enclosure A is organized as follows. A "Table of Contents" identifies the EPA's "Deliverable-Specific Comments," "Appendix A (Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical)," "Appendix B (Example Schematic Ecological Conceptual Site Model)," and "Appendix C (Additional and Revised Judgmental Sampling Locations)." The deliverable-specific comments consist of the EPA's comments pertaining to the information contained in each of NORCO's Second Amended Draft RI/FS deliverables. Appendix A consists of an example of a probabilistic sampling design, prepared from Visual Sample Plan software, that could be applied in Phase II of the RI/FS for the Site. Appendix B consists of an example of a schematic of an ecological conceptual site model that could be appropriate for this Site and would be easily understood by the public. Appendix C consists of the additional and revised judgmental sampling locations required by the EPA.

TABLE OF CONTENTS

Deliverable-Specific Comments
Second Amended Draft Remedial Investigation and Feasibility Study
Work Plan

The following "Deliverable-Specific Comments" pertain to the EPA's comments on the Second Amended Draft WP. The deliverable-specific comments are listed numerically by the sections, pages, and paragraphs corresponding to the Second Amended Draft WP required pursuant to the AOC. A paragraph number corresponds to the sequence of a paragraph within a section.

1. Document Title Page - Header

Second Amended Draft Work Plan

The header of the Second Amended Draft WP's title page (and subsequent pages) indicates "Revision 00."

EPA's Comments

The Draft Final WP shall be revised to indicate "Revision 03."

2. Table of Contents - Appendix G (Page 6)

Second Amended Draft Work Plan

The "Table of Contents" of the Second Amended Draft WP identifies Appendix G (Ecological Benchmarks).

EPA's Comments

The text of the "Table of Contents" section of the Second Amended Draft WP incorrectly identifies Appendix G. The Draft Final WP shall be revised to reflect Appendix G (Comparison of Quantitation Limits to Ecological Screening Standards). Additionally, the "Comparison of CLP CRQLs to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs" shall be included in a separate appendix and titled "Comparison of Quantitation Limits to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs."

3. Section 2.0 - Site Background and Setting (Page 12, 2nd Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 1 (Area Map).

EPA's Comments

Figure 1 of the Draft Final WP shall be revised to depict "FM 361," "FM 2725," and "Bishop Road."

4. Section 2.1 - Site History (Page 12, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 2 (Site Map).

EPA's Comments

Figure 2 does not reflect the correct locations for the historic barge dock nor the pipelines leading to this barge dock. Figure 2, of the Draft Final WP, shall be replaced with the pipeline map recently provided to the EPA's On-Scene Coordinator for the ongoing removal action. Additionally, this map, or another map, shall identify the ownership of the pipelines which shall include NORCO's pipelines leading to the current and historic barge docks.

5. Section 2.2.1 - Site Physical Characteristics (Page 13; 2nd, 4th and 5th Paragraphs)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figures 3 (North Site) and 4 (South Site) and states that:

> "Two additional tanks N1 and N2, were also used to store product, including CERCLA hazardous substance . . . ."

EPA's Comments

Figure 3, of the Draft Final WP, shall include the half buried concrete tank shown on previous maps submitted by NORCO and shall identify the acronym "AOC-1N." Additionally, this acronym, and other acronyms, shall be identified in all maps included in the Draft Final WP (including the Draft Final FSP and QAPP). Figure 4, of the Draft Final WP, shall identify the acronym "AOC-1S" and shall depict Tanks N1 and N2.

The Draft Final WP shall be revised to state that:

> "Two additional tanks N1 and N2 (Tanks 32 and 33, respectively, of the main processing area of the refinery [Figure 4]), were also used to store product, including CERCLA hazardous substances . . . ."

6. Section 2.2.1.4 - Surface Water Hydrology (Page 15; 3rd, 4th, and 6th Paragraphs)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 5 (Culvert Map) and states that:

> "There are two probable points of entry (PPE) for hazardous substances from the Site to surface water. The first PPE is overland flow from the Site through sandy berms and the cracked foundation of a lined surface impoundment. The second PPE is located at the dock facility on the Intracoastal Waterway."
>
> . . . . . .
>
> However, it is possible that the permit was never used and the discharge pipeline may have never been constructed to the outfall point. It is believed that the wastewater treatment effluent may have been directly discharged into the unpermitted wetland area immediately adjacent to the Site."

EPA's Comments

Figure 5, of the Second Amended Draft WP, does not reflect the correct locations for the historic barge dock nor the pipelines leading to this barge dock. Figure 5, of the Draft Final WP, shall be replaced with the pipeline map recently provided to the EPA's On-Scene Coordinator for the ongoing removal action. Additionally, this map, or another map, shall identify the ownership of the pipelines which shall include NORCO's pipelines leading to the current and historic barge docks.

Additionally, the Draft Final WP shall be revised to state that:

> "Hazardous substances from the Site possibly entered surface water by overland flow from the Site through sandy berms and the cracked foundation of a lined surface impoundment and by surface water runoff during rain events. Hazardous substances also possibly entered the Intracoastal Waterway from the current and historical docking facilities by overland flow and surface water runoff during rain events and through the culvert located north of the historical barge docking facility.
>
> . . . . . .
>
> However, there are no records to indicate that wastewater effluent discharges occurred under the permit and that the permit was ever used. Additionally, there are no records to indicate that the discharge pipeline was ever constructed to the

outfall point at Corpus Christi Bay. It is believed that the wastewater treatment effluent may have been directly discharged into the unpermitted wetland area immediately adjacent to the Site."

7. ***Section 2.2.1.6 - Human Population and Land Use (Pages 16 and 17; 1st, 2nd, and 6th Paragraphs)***

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 6 (Falcon Pipeline Excavation Project, Surrounding Industry) and Appendix B (Water Well Report) and states that:

> "Provided in Appendix C are Annual Waste Summary forms for a few of the adjacent facilities.
>
> . . . . . .
>
> When the RI data are obtained the COPC will be evaluated and compared to the listed facilities."

EPA's Comments

Figure 6 of the Draft Final WP should be revised to delete the title "Falcon Pipeline Excavation Project." The map entitled, "Map of Wells Within One Mile," included in Appendix B, shall be revised in the Draft Final WP to state that the numbers provided in the map, identifying wells or well clusters, correspond to the Map ID numbers included in the "Water Well Report" of Appendix B.

For clarification purposes, concerning the Annual Waste Summary forms and comparisons of COPCs to the listed facilities, the EPA entered into an agreement for the performance of an RI/FS with only NORCO. As the sole respondent and party to the AOC, NORCO is the sole responsible party bound by the terms of the AOC and is strictly liable under CERCLA. That is, under the terms of the AOC, the EPA has determined that NORCO is responsible for the RI/FS at the Site without proving that NORCO was at fault for the releases or potential releases of hazardous substances, pollutants, or contaminants "at" or "from" the Site. The EPA's process of identifying PRPs is an ongoing process and must not delay NORCO's performance of the RI/FS for this Site as directed by the EPA. In the event that other PRPs for the Site are identified, NORCO may "seek contribution from any other person who is liable or potentially liable" in accordance with CERCLA §113(f).

8. Section 2.2.1.7 - Endangered and Threatened Species (Page 18, 2nd Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Although potentially suitable habitat for these special-status species occurs on and adjacent to the project site it does not guarantee the presence or optimum use of special-status species. Additional species-specific focused surveys will be needed to ascertain this data."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Although potentially suitable habitat for these special-status species occurs on and adjacent to the project site, it does not guarantee the presence or optimum use of special-status species. Additional species-specific focused surveys will be needed to ascertain this data.
>
> Both federally-listed and state-listed species shall be addressed in the ERA. In order to eliminate a threatened/endangered species as being potentially present, an ERA will provide supporting documentation from a wildlife management agency to confirm the absence of the protected species on the affected property. If this is not possible due to the time constraints associated with the project, a discussion will be provided for the lack of suitable habitat by comparing the available habitat with the habitat needs of threatened/endangered species that could possibly occur in the county. It will not be enough to simply assume that no protected species are known to occur at the Site.
>
> If the presence or absence of a protected species cannot be determined, then the species will be considered as being present and potentially impacted. For species known to use the area or suspected to use the area due to habitat suitability, the ERA must then demonstrate through exposure or action level determination that the species will either not be impacted, or that protective cleanup levels will be developed. These demonstrations are usually accomplished by calculating the exposure and evaluating the risk to a receptor that is a surrogate (a receptor from the same feeding guild) for the protected species. In this case, the ERA should also explain why the particular receptor chosen is a suitable surrogate for the sensitive species. Finally, where a protected species is known to occur or could possibly occur at the Site based on habitat suitability, any cleanup levels should be based on the NOAEL toxicity reference value (TRV)."

9. Section 2.2.1.7 - Endangered and Threatened Species (Page 18, 4th Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Once the Phase I data are evaluated, a site-specific habitat food web appropriate for the site will be finalized and presented in the ERA. As the media . . . ."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Once the Phase I data are evaluated, a site-specific habitat food web appropriate for the site will be finalized and presented in the ERA. Phases I and II of the RI/FS are discussed in more detail in this Work Plan and in the Field Sampling Plan and Quality Assurance Project Plan. As the media . . . ."

Additionally, the Draft Final WP shall be revised to include a detailed discussion of Phases I and II of the Remedial Investigation and Feasibility Study for the Site. Since little information exists on the distribution of chemical risk drivers at the Site, the sampling strategy will have to be carried out in at least two phases. The EPA does not desire to abandon a contaminated site nor clean up a clean site, and a well developed field sampling plan will limit the possibilities of making these decision errors.

For Phase I, the number of soil, sediment, ground water, and surface water judgmental or random-grid sampling locations was initially determined by the Site Team and is not based on the distribution of the risk drivers, if any, for the Site. Ideally, Phase I would determine the distribution of the risk drivers for the Site. The standard deviation, alpha and beta error rates, width of the gray region, and a threshold value (screening value) can then be used in Phase II as input into Visual Sample Plan software algorithms to statistically determine the minimum number of samples required to meet the Data Quality Objectives for the Site. Appendix A (Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical) is an example of a probabilistic sampling design, prepared from Visual Sample Plan software, that could be applied in Phase II of the RI/FS for the Site. Another scoping meeting will be held to evaluate the data gathered during Phase I and to determine the actions required for Phase II.

For human health and ecological risk assessment screening purposes, any chemicals detected at the Site above their respective screening levels will be carried forward in the risk assessments required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), taking into account synergistic effects. For ecological risk assessment screening purposes, bioaccumulative chemicals may need to be carried forward in the risk assessment if found below their respective screening levels. For both the human health and ecological risk

assessments, the maximum detected concentrations shall be used for risk screening purposes. The statistically derived 95 percent upper confidence limit (UCL) of the arithmetic mean (if the sample size is adequate) or maximum concentration (if the sample size is inadequate), whichever is appropriate for a given medium, will be calculated for use as the concentration term in the risk assessment equations following the risk screening process. The statistical methods described in the EPA's guidance documents for calculating UCLs are based on the assumption of random sampling.

10. Section 2.2.3 - Nature and Extent of Contamination (Page 21, 5th Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "It should be noted that NORCO, which did not own, operate or have any relationship with GCC at any time."

EPA's Comments

This statement shall be excluded from the Draft Final WP since it does not relieve NORCO of their responsibility as a PRP to address all contamination "at" or "from" the Site. This statement has no relevance to this investigation and NORCO's responsibility, under the AOC for a RI/FS, to investigate the Site.

11. Section 2.2.3.1 - Ground Water (Page 22, 6th Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Previous investigations have revealed that soil and ground water are impacted at the site and on property not owned by Plains."

EPA's Comments

The Draft Final WP shall be revised to exclude this statement. Any impacts to the soil and ground water at the Site will be determined during the RI/FS for the Site.

12. Section 2.2.3.2 - Soil (Page 22, 2nd and 3rd Paragraphs)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 8 (1979 Spill Map) and states that:

"The second source from the 1979, TACB inspection was associated with open pit bottom settlements from Tank 15."

EPA's Comments

Figure 8 of the Draft Final WP shall be revised to depict "FM 2725," "Bishop Road," and the "North and South Sites." Additionally, the legend shall include the text "Bottom Sediments" instead of "Bottom Settlements." The Draft Final WP shall also be revised to state that:

"The second source, from the 1979 TACB inspection, was associated with open pit bottom sediments from Tank 15."

13. Section 2.2.3.2 - Soil (Page 23, 6th Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 10 (1982 Waste Pile Location Map).

EPA's Comments

Figure 10 of the Draft Final WP shall be revised to depict "FM 2725," "Bishop Road," and the "North and South Sites."

14. Section 2.2.3.2 - Soil (Page 23, 7th Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 11 (1986 Spill Map).

EPA's Comments

Figure 11 of the Draft Final WP shall be revised to depict "FM 2725," "Bishop Road," and the "North Site and South Sites."

15. Section 2.2.3.4 - Sediment (Pages 26 and 27; 2nd, 6th, and 7th Paragraphs)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 12 (ARM Pipeline Spill), which depicts a location for the 1985 ARM spill, and Figures 13 (MJP Pipeline Spill) and 14 (Offshore Specialty Fabricators Pipeline Spill), and states that:

"The location was provided based on eye witness accounts.

. . . . . .

On April 4, 1996, Jones and Neuse conducted grid sampling at the spill site.

. . . . . .

On July 22, 1992, the Texas Natural Resources Conservation Commission . . . issued a letter to Mr. Dickey Henderson . . . ."

EPA's Comments

Figures 12, 13, and 14, of the Draft Final WP, shall be revised to depict the "South Site." Additionally, Figure 12 shall be revised to replace the text "ARM Pipeline Spill" with "Possible ARM Pipeline Spill Location." There are no historical records to indicate the location of the 1985 ARM spill, and the possibility exists that the actual spill could have occurred on or nearer to NORCO's property (the South Site). The EPA's conclusion is based on the fact that in 1987 an ARM representative repaired a pipeline located on NORCO's property (pipeline rack) and performed bulldozing activity in an attempt to "eliminate odors." Also, the Draft Final WP shall be revised to state that:

"The possible location of the ARM spill was provided based on eye witness accounts and the current location of Plains Marketing's pipeline which leads to their current docking facility.

. . . . . .

On April 4, 1996, Jones and Neuse conducted grid sampling at the spill site (Figure 13 - MJP Pipeline Spill).

. . . . . .

"On July 29, 2002, the Texas Natural Resources Conservation Commission . . . issued a letter to Mr. Dickey Henderson . . . ."

16. Section 3.0 - Initial Evaluation (Page 31, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 15 (Human Health and Ecological Conceptual Site Model) which consists of a flow diagram and states that:

"• = Pathway identified for elevation in the human health risk assessment.

o = Identified as a low potential for exposure. Pathway not identified for evaluation in the human health risk assessment."

EPA's Comments

The Draft Final WP shall be revised to include, in addition to the flow diagrams, the conceptual site models in schematic format which is easily understood by the public. Appendix B (Example Schematic Ecological Conceptual Site Model) provides an example of a schematic of an ecological conceptual site model that could be appropriate for this Site and would be easily understood by the public. The schematic of the ecological conceptual site model included in the Second Amended Draft WP does not adequately depict the exposure pathways and receptors. The Draft Final WP shall also include a similar schematic for the human health conceptual site model.

Additionally, the trespasser scenario shall consider someone who trespasses on-site and uses the wetlands for fishing since they may consume fish from the wetland areas. The trespasser scenario shall also include off-site sediment and surface water in the wetland area since a trespasser is likely to wander into both on- and off-site areas. The conceptual site model shall also be revised to depict leaks and spills as a primary release mechanism to the on- and off-site wetlands and to depict the fish ingesting fish/shellfish pathway for releases from the dock facilities into marine/coastal waters. The conceptual site model shall also consider that mammals, birds, and reptiles could be indirectly exposed to site COPECs due to the ingestion of soil and sediment invertebrates and plants. It appears that Figure 15 currently only reflects the direct exposure pathways.

The Draft Final WP shall be revised to state that:

"• = Pathway identified for evaluation in the human health and ecological risk assessments.

o = Identified as a low potential for exposure. Pathway not identified for evaluation in the human health risk and ecological risk assessments."

17. Section 3.1 - Types and Volumes of Waste (Page 31)

Second Amended Draft Work Plan

This section of the Second Amended Draft WP provides a brief discussion of the wastes that remain at the Site and states that:

> "Residual liquids . . . have been removed as well as liquids in the abandoned underground pipelines that connect the refinery to the former and current barge dock facilities."

EPA's Comments

Paragraph 25 (Task 6 - Site Characterization) of the RI/FS SOW states that:

> "The Respondent shall first identify the sources of contamination and define the nature, extent, and volume of the sources of contamination, including their physical and chemical constituents."

The Draft Final WP shall include the recent data that has been collected as a result of the ongoing Removal Action. This data shall include the types and volumes of wastes, including their chemical constituents, that remain at the Site, including those wastes in the tanks and pipelines, and those wastes that have been removed. Additionally, the Draft Final WP shall include a summary of the recent activity conducted under the Removal Action to address the pipelines leading from the refinery to the historic and current barge docking facilities and shall reference the reports recently submitted to the EPA's On-Scene Coordinator for the Removal Action.

18. Section 5.4 - Community Relations (Page 34, 4th Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Mrs. Teresa A. Carrillo, the Executive Director for the CBBF, ..."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Mrs. Lois C. Huff, the Executive Director for the CBBF, ..."

19. Section 5.5.4 - Guidelines for Data Reduction (Page 37, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

"• If a chemical is not positively identified in any sample from a given medium, because it is reported as a nondetect and/or because of blank contamination (as explained below), it will not be addressed for that medium.

. . . . . .

- In general for risk assessment purposes . . . that do not meet the following guidelines:
- Sampling methodologies do not artificially increase or decrease naturally suspended particle concentrations.
- Ground water samples should be collected using a low flow rate.
- Ground water samples should generally not be filtered."

EPA's Comments

The Final Draft WP shall be revised to state that:

"• If a chemical is not positively identified in any sample from a given medium, because it is reported as a nondetect and/or because of blank contamination (as explained below), it will not be addressed for that medium. A chemical will be carried forward into the risk assessment at ½ of the detection limit if a chemical's detection limit is higher than the respective screening value.

. . . . . .

- In general for risk assessment purposes . . . that do not meet the following guidelines:

  - Sampling methodologies do not artificially increase or decrease naturally suspended particle concentrations.

  - Ground water samples should be collected using a low flow rate.

  - Ground water samples should generally not be filtered."

20. Section 5.5.5 - Guidelines for Selection of Chemicals of Potential Concern (Page 38, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "• Inorganic chemicals that are (1) essential human nutrients, (2) present at low concentrations (i.e., only slightly elevated above naturally occurring levels), and (3) toxic only at very high doses (e.g., calcium, iron, potassium, magnesium, and sodium) will not be evaluated as COPCs."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "• Inorganic chemicals that are (1) essential human nutrients (e.g., calcium, iron, potassium, magnesium, and sodium) will not be evaluated as COPCs. Those chemicals (e.g., zinc and selenium, among others) that are both essential human nutrients and toxic at higher concentrations will be evaluated as COPCs."

21. Section 5.5.8 - Current and Future Land Use (Page 39, 1st and 2nd Paragraphs)

Second Amended Draft Work Plan

The Second Amended Draft WP describes the current and future land use for the Site and the adjacent areas.

EPA's Comments

The Draft Final WP shall be revised to add the following text:

> "The on-site areas of the Site will be evaluated using industrial and trespasser scenarios. The off-site residential areas will be evaluated using a residential scenario. Potential recreational uses will be evaluated in the on- and off-site wetlands and the areas adjacent to the current and historical docking facilities."

22. Section 5.5.20 - Approach for Developing Preliminary Remediation Goals (Page 46, 1st and 2nd Paragraphs)

Second Amended Draft Work Plan

This section of the Second Amended Draft WP briefly describes the approach for developing Preliminary Remediation Goals and states that:

> "EPA Region 6 Human Health Medium Specific Screening Levels (MSSL) will be used to define the Preliminary Remediation Goals (PRG)."

EPA's Comments

This section of the Draft Final WP shall be revised to add the following statements:

> "The approach for calculating PRGs is discussed in the EPA's PRGs directive entitled, 'Human Health Evaluation Manual, Part B: Development of Risk-Based Preliminary Remediation Goals' (OSWER Directive 9285.7-01B, December 13, 1991). Part B provides guidance on using U.S. Environmental Protection Agency (EPA) toxicity values and exposure information to derive risk-based PRGs. Initially developed at the scoping phase using readily available information, risk-based PRGs generally are modified based on site-specific data gathered during the remedial investigation/feasibility study (RI/FS).
>
> Chemical-specific PRGs are concentration goals for individual chemicals for specific medium and land use combinations at CERCLA sites. There are two general sources of chemical-specific PRGs: (1) concentrations based on ARARs and (2) concentrations based on risk assessment.
>
> The recommended approach for developing remediation goals is to identify PRGs at scoping, modify them as needed at the end of the RI or during the FS based on site-specific information from the baseline risk assessment, and ultimately select remediation levels in the Record of Decision (ROD).
>
> In general, the equations described in the EPA's PRG directive are sufficient for calculating the risk-based PRGs at the scoping stage of the RI/FS. Note, however, that these equations are based on standard default assumptions that may or may not reflect site-specific conditions."

The EPA's Region 6 MSSLs have been developed according to the approach recommended in the EPA's 1991 PRGs directive. The establishment of PRGs (i.e., MSSLs,

Ecological Screening Levels, and ARARs) early in the RI process, usually at scoping, serves as the basis for the RI/FS FSP and QAPP. Detection limits need to be reviewed before the FSP and QAPP are completed to ensure that the proposed analytical methods will have adequate quantitation limits and the Site can be adequately characterized. Quantitation limits shall be less than human health and ecological screening levels.

The Draft Final WP shall also be revised to state that:

> "EPA Region 6 Human Health Medium Specific Screening Levels (MSSL) or TCEQ Tier 1 Residential PCLs, whichever is more stringent, will be used to define the Preliminary Remediation Goals (PRG)."

23. Section 5.6 - Baseline Ecological Risk Assessment (Page 46)

Second Amended Draft Work Plan

This section of the Second Amended Draft WP discusses the Baseline Ecological Risk Assessment.

EPA's Comments

For clarification purposes, the Screening Level Ecological Risk Assessment Report shall include a discussion of the topography encountered, during the RI sampling effort, within the sediment sampling area to allow an understanding of the depositional areas sampled.

24. Section 5.6.1 - Screening Level Problem Formulation and Ecological Effects Evaluation - Step 1 (Page 47, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "A CSM will be developed to identify the following five issues:
>
> Environmental setting and contaminants . . . at the Site.
>
> Contaminant fate and transport mechanisms.
>
> Mechanisms of ecotoxicity . . . of affected receptors.
>
> Complete exposure pathways.
>
> Selection . . . for ecological risk."

EPA's Comments

The Draft Final WP shall be revised to include this section in "bullet" format as follows:

"A CSM will be developed to identify the following five issues:

- Environmental setting and contaminants . . . at the Site,
- Contaminant fate and transport mechanisms,
- Mechanisms of ecotoxicity . . . of affected receptors,
- Complete exposure pathways, and
- Selection . . . for ecological risk."

25. ***Section 5.6.2 - Screening Level Exposure Estimate and Risk Calculation - Step 2 (Page 48, 1st Paragraph)***

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Appendix G (Ecological Benchmarks).

EPA's Comments

The Draft Final WP shall be revised to reflect Appendix G (Comparison of Quantitation Limits to Ecological Screening Standards). Additionally, the "Comparison of CLP CRQLs to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs" shall be included in a separate appendix, for easy reference, and titled "Comparison of Quantitation Limits to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs." The EPA's Region 6 MSSLs, TCEQ's Tier 1 PCLs, and TCEQ's ecological screening levels have been updated. The Draft Final WP (including the Draft Final FSP and QAPP) shall be revised to include an updated Appendix G. The sources listed in Appendix G shall be revised to reflect the sources discussed in the text of the Draft Final WP.

For clarification purposes, the chemicals included in Appendix G, of the Second Amended Draft WP, are derived from the EPA's Contract Laboratory Program (CLP). The CLP is a national network of EPA personnel, commercial laboratories, and support contractors whose fundamental mission is to provide customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies) with analytical data of known and documented quality. The CLP provides its customers with services such as environmental sample analyses.

These analytical services are designated as "CLP SOM01.1" for organics and "CLP ILM05.3" for inorganics. The "target compound list" for organics and the "target analyte list" for inorganics, included in Appendix G of the Second Amended Draft WP, do not include all of the chemicals that may be of potential concern at the Site (e.g., vinyl acetate, among others). Additionally, the analytical services provided by the CLP are not accessible to Potentially Responsible Parties.

Appendix G, of the Draft Final WP, shall be revised to include all of the chemicals that may be of potential concern at the Site. These chemicals include, but are not limited to, total polycyclic aromatic hydrocarbons (including the PAHs listed in the TCEQ's 2001 guidance), hexavalent chromium, vinyl acetate, those chemicals analyzed for the HRS Documentation Record, and those chemicals that are associated with refinery processes.

The chemicals listed in the table of Appendix G, of the Second Amended Draft WP, need to be rearranged in the Draft Final WP, including the new appendix for the human health screening criteria, for easy reference. The chemicals should be arranged alphabetically by chemical type (e.g., organics [VOCs and SVOCs] and inorganics, etc.).

Appendix G, or the text of the Draft Final WP, shall identify which risk values will be used in the risk screening process and the appendix shall be modified to reduce the number of significant digits. Additionally, maximum contaminant levels (MCLs) shall be provided in the screening table when available for a particular chemical.

The surface water ecological benchmarks of Appendix G, of the Second Amended Draft WP, are benchmarks for fresh water. Appendix G, of the Draft Final WP, shall be revised to include benchmarks for salt water since both fresh water and salt water exist at the Site. Additionally, Appendix G and/or the text of the Draft Final WP shall provide an explanation of how brackish water will be classified.

Appendix G, of the Draft Final WP, shall be revised to include benchmark values for marine and freshwater sediments since both are present at the Site. Additionally, Appendix G shall be revised to depict soil and sediment benchmarks separately. Soil and sediment benchmarks should not be combined.

"Footnote 3" of Appendix G, of the Second Amended Draft WP, states that ecological benchmarks provided below are described in Table 5-5. The Second Amended Draft WP does not include Table 5-5. The text of Footnote 3 should be deleted from the Draft Final WP or revised to reflect the appropriate reference.

Appendix G, of the Second Amended Draft WP, lists the source for several of the benchmarks as the Region 6 Ecological Screening Benchmark Tables. The EPA Region 6 Ecological Screening Benchmark Tables shall not be used for this RI/FS. These benchmarks have not been peer reviewed and are outdated. The primary source of ecological benchmark values will be the TCEQ 2006 ecological screening benchmarks. If a COPC is not listed in the

TCEQ ecological screening benchmark tables, then a search for additional sources of benchmark values will be conducted, and the source of the benchmark values will be documented so that details of how the benchmark values were developed can be verified. If a benchmark is not proposed, then the COPC will be retained and evaluated further during the baseline ecological risk assessment. The Draft Final WP (including the FSP and QAPP) shall be revised accordingly.

Appendix G, of the Draft Final WP, shall list primary literature searches, for benchmark values other than TCEQ ecological benchmarks (since these are already referenced), so that details on how the benchmark values were developed can be researched and verified.

The text of the Draft Final WP shall discuss how chemicals will be treated if their respective quantitation limit is greater than the appropriate benchmark.

26. Section 5.6.2 - Screening Level Exposure Estimate and Risk Calculation - Step 2 (Page 48, 3rd Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "COCs that exceed the selected ecological benchmarks will be retained as COPECs as described in detail by the data reduction method."

EPA's Comments

The Second Amended Draft WP does not include a data reduction method for the ecological risk assessment. The Draft Final WP shall be revised to include a data reduction method for each step of the ecological risk assessment as appropriate.

27. Section 5.6.2 - Screening Level Exposure Estimate and Risk Calculation - Step 2 (Page 48, 3rd Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Bioaccumulative COPECs will be retained for further evaluation if they are detected in site media potentially posing a risk of bioaccumulation to higher trophic levels, even if they are present at concentrations below the screening level benchmark.

. . . . . .

> At the conclusion of this step, it will be determined, with the EPA's approval, that no COCs are retained based on the ecological screening, ..."

EPA's Comments

The Second Amended Draft WP shall be revised to state that:

> "Bioaccumulative COPECs, including individual and total polycyclic aromatic hydrocarbons, will be retained for further evaluation if they are detected in any site media potentially posing a risk of bioaccumulation to higher trophic levels, even if they are present at concentrations below the screening level benchmark. Chemicals without screening levels will be carried forward in the ecological risk assessment, including those chemicals where their quantitation limits exceed their respective screening levels if there is any data indicating that the chemical could be present at the Site.
>
> . . . . . .
>
> At the conclusion of this step, if it is determined, with the EPA's approval, that no COCs are retained based on the ecological screening, ..."

The Second Amended Draft WP does not identify an approach to be used for the identification of chemicals with the potential for bioaccumulation for each particular media. The Draft Final WP shall be revised to identify the approach for the identification of chemicals with bioaccumulation potential discussed in the EPA's guidance document entitled "Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments" (Interim Final, EPA 540-R-97-06, June 1997). The TCEQ's guidance documents entitled "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas" (RG-263, December 2001) and "Update to Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas" (RG-263, 2006) shall also be consulted. Additionally, the Draft Final WP shall be revised to provide a listing of the compounds that will be characterized as bioaccumulating or describe how chemicals will be characterized as bioaccumulating.

28. Section 5.6.2.1 - Approach for Developing Ecological Screening Levels (Page 48, 1st Paragraph)

Second Amended Draft Work Plan

This section of the Second Amended Draft WP describes several sources of benchmark values for ground water, surface water, sediments, and soil.

EPA's Comments

The sources listed in the Second Amended Draft WP do not appear to be the same as the sources referenced in the footnotes included in Appendix G. The Draft Final WP, and/or Appendix G, shall be revised to include the appropriate text.

29. Section 5.6.2.1.2 - Ground Water/Surface Water (Pages 48 and 49, 1st and 2nd Paragraphs)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Screening levels for ground water and surface water will be based on Federal ambient water quality criteria . . . or benchmarks that have been developed by ORNL . . ., whichever value is most stringent.
>
> . . . . . .
>
> For those contaminants at the site that have the potential to bioaccumulate (e.g., pesticides and polychlorinated biphenyls [PCBs]), it may be necessary to evaluate the potential for trophic transfer to terrestrial wildlife in developing screening levels for surface waters. The potential for evaluating this pathway as part of the screening level risk assessment will be discussed further with EPA Region 6 and the state and federal trustees."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Screening levels for ground water and surface water will be based on Federal ambient water quality criteria . . . or benchmarks that have been developed by TCEQ (2006) or ORNL . . ., whichever value is most stringent.
>
> . . . . . .
>
> For those contaminants detected in the ground water/surface water at the site that have the potential to bioaccumulate (e.g., pesticides and polychlorinated biphenyls [PCBs]), and a pathway is complete, it will be necessary to evaluate the potential for trophic transfer to terrestrial wildlife in developing screening levels for surface water."

30. Section 5.6.2.1.3 - Sediments (Page 49, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Screening levels for sediments will be based on the guidelines for freshwater sediments as proposed in the Guidance for Conducting Ecological Risk Assessment at Remediation Sites in Texas (TCEQ), . . . and the sediment guidelines developed by the Florida . . . (FDEP, 1994).
>
> . . . . . .
>
> A hierarchy of values will also be established."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Screening levels for sediments will be based on the guidelines for freshwater sediments as proposed in the Guidance for Conducting Ecological Risk Assessment at Remediation Sites in Texas (TCEQ 2006, updated), . . . and the sediment guidelines developed by the Florida . . . (FDEP, 1994).
>
> . . . . . .
>
> A hierarchy of values will also be established."

Additionally, the Draft Final WP shall be revised to include a hierarchy of sediment screening values that will be used during the RI/FS for the Site.

31. Section 5.6.3.1.4 - Identification of Ecological Receptors (Page 52, 3rd Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Table 1 and states that:

> "The San Patricio County, Texas currently has 29 animal species . . . (Table 1)."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "San Patricio County currently has 29 animal species . . . (Table 1 - Listed and Endangered and Threatened Species)."

Additionally, Table 1 of the Draft Final WP shall be entitled "Listed Endangered or Threatened Species."

32. Section 5.6.3.1.5 - Identification of Exposure Pathways (Page 53, 2nd Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies Figure 15 (Human Health and Ecological Conceptual Site Model) which consists of a flow diagram and states that:

> "• = Pathway identified for elevation in the human health risk assessment.
>
> ○ = Identified as a low potential for exposure. Pathway not identified for evaluation in the human health risk assessment."

EPA's Comments

The Draft Final WP shall be revised to include, in addition to the flow diagrams, the conceptual site models in schematic format which is easily understood by the public. Appendix B (Example Schematic Ecological Conceptual Site Model) provides an example of a schematic of an ecological conceptual site model that could be appropriate for this Site and would be easily understood by the public. The schematic of the ecological conceptual site model included in the Second Amended Draft WP does not adequately depict the exposure pathways and receptors. The Draft Final WP shall also include a similar schematic for the human health conceptual site model.

Additionally, the trespasser scenario shall consider someone who trespasses on-site and uses the wetlands for fishing since they may consume fish from the wetland areas. The trespasser scenario shall also include off-site sediment and surface water in the wetland area since a trespasser is likely to wander into both on- and off-site areas. The conceptual site model shall also be revised to depict leaks and spills as a primary release mechanism to the on- and off-site wetlands and to depict the fish ingesting fish/shellfish pathway for releases from the dock facilities into marine/coastal waters. The conceptual site model shall also consider that mammals, birds, and reptiles could be indirectly exposed to site COPECs due to the ingestion of soil and sediment invertebrates and plants. It appears that Figure 15 currently only reflects the direct exposure pathways.

The Draft Final WP shall be revised to state that:

> "• = Pathway identified for evaluation in the human health and ecological risk assessments.
>
> ◦ = Identified as a low potential for exposure. Pathway not identified for evaluation in the human health risk and ecological risk assessments."

33. Section 5.6.3.1.6 - Ecotoxicity of Contaminants (Page 53, 2nd and 3rd Paragraphs)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "The 'sediment to invertebrate' and 'sediment to fish' pathways will be addressed in the ecological risk assessment.
>
> . . . . . .
>
> Screening benchmarks for amphibians, reptiles, and plants (receptors to soil) developed by ORNL (1996) from the RAIS will be used to assess impacts on these receptor groups."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "The 'sediment to invertebrate' and 'sediment to fish' pathways will be addressed in the ecological risk assessment. This evaluation shall also consider population effects as well as possible risks to vertebrates that consume fish and invertebrates exposed to sediment COPECs.
>
> . . . . . .
>
> Media-specific screening benchmarks for amphibians, reptiles, and plants (receptors to soil) developed by ORNL (1996) from the RAIS will be used to assess impacts on these receptor groups."

The Draft Final WP shall be revised to include the ORNL (1996) document, in the list of references, which should provide media-specific screening values for reptiles and amphibians. These receptor groups will be evaluated using appropriate media-specific benchmarks. A more

rigorous quantitative evaluation of these receptors may need to be performed, particularly where there is a possibility that a protected species could occur at or nearby the Site. Additionally, the Draft Final WP shall be revised to include a discussion of reptilian and amphibian susceptibility to the COPCs present at the Site and the uncertainty related to the lack of toxicity data for these receptors.

34. Section 5.6.3.2.1 - Selection of Target Receptors and Communities and Routes of Exposure (Page 56, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Fish, benthic organisms, amphibians, reptiles, and plants will be evaluated as communities."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Fish, benthic organisms, amphibians, reptiles, and plants will be evaluated as communities. When selecting communities for evaluation, receptor communities that are present in freshwater and marine systems will be evaluated separately."

35. Section 5.6.3.2.2 - Exposure Point Concentrations (Pages 57 and 58, 2nd and 8th Paragraphs)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Exposure point concentrations will be developed for the soil, taking into account potential 'hot spots' of contamination as well as availability of appropriate habitat.
>
> . . . . . .
>
> With the exception of shallow groundwater that may provide a source to terrestrial vegetation, the groundwater is an incomplete ecological pathway unless there is a groundwater discharge to surface water."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Exposure point concentrations will be developed for the soil, taking into account potential 'hot spots' of contamination as well as availability of appropriate habitat. The hot spot evaluation shall also consider the magnitude of the chemical concentration as well as the habitat needs and home range of the receptor in question.
>
> . . . . . .
>
> With the exception of shallow groundwater that may provide a source to terrestrial vegetation, the groundwater is an incomplete ecological pathway unless there is a groundwater discharge to sediments and/or surface water."

For clarification purposes, if it is determined during the initial sampling that there is a likely release of impacted ground water to surface water, the ground water-to-sediment pathway shall also be considered. In this case, sediment samples shall be collected and analyzed in the area of upwelling or release of impacted ground water. Comparison of ground water concentrations to surface water criteria is not necessarily a good assessment of potential impacts to sediment in the area of the ground water release. In this case, the evaluation can be supported by the sampling and analysis of sediment samples collected in the area of the interface.

36. Section 5.6.3.3.2 - Derivation of Reference Toxicity Values (Page 61, 2nd and 8th Paragraphs)

Second Amended Draft Work Plan

This section of the Second Amended Draft WP discusses the derivation of reference toxicity values.

EPA's Comments

The Draft Final WP shall be revised to address the higher level of protection afforded threatened and endangered species, such as documented protection at the NOAEL. Additionally, the Draft Final WP shall identify which areas of the Site will be evaluated using freshwater or marine screening benchmarks.

For clarification purposes, the selection of NOAEL toxicity values should not default to the highest available NOAEL, unless the range of available toxicity data supports the selection (e.g., data are available for the relevant routes of exposure, study endpoints, test species and test concentrations).

37. Section 5.6.7.2.1 - Bioaccumulation and Field Tissue Residue Studies (Page 66, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Types of residue studies that may be considered for future ecological risk assessment work at the Site include earthworm, . . ., and fish tissue residue studies (EPA, 1997)."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Types of residue studies that may be considered for future ecological risk assessment work at the Site include earthworm, . . ., and fish tissue residue studies (EPA, 1997), including sediment invertebrate residue studies for invertebrates in the wetlands or Intracoastal Waterway/Redfish Bay."

38. Section 5.6.7.2.3 - Toxicity Tests (Page 67, 1st Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Tests can either be acute or chronic. Acute toxicity tests are short-term . . . ."

EPA's Comments

The Draft Final WP shall be revised to state that:

> "Tests can either be acute or chronic. Acute tests last a short time, generally 4 days or less and mortality is the response measured. Chronic tests are used to study the effect of continuous, long-term exposure. Acute toxicity tests are short-term . . . ."

For clarification purposes, the definitions provided in the Second Amended Draft WP for acute and chronic toxicity tests are inaccurate. When used to describe toxicity tests, these terms do not typically indicate level of exposure. The text, of the Second Amended Draft WP, states that chronic tests expose organisms to lower contaminant concentrations and that acute tests

involve exposure to relatively high concentrations. Acute and chronic toxicity tests are most often meant to characterize duration of exposure (short or long periods). The Draft Final WP shall be revised accordingly.

39. Section 5.8.2.1 - Task 1 - Develop Remedial Action Objectives (Page 76, 3rd Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP states that:

> "Preliminary development of the remediation goals will be based on the information including reference doses, risk-specific doses, or frequently used standards, such as Applicable or Relevant and Appropriate Requirements (ARARs)."

EPA's Comments

The Draft Final WP shall be revised to include a discussion and preliminary list of the probable "Applicable or Relevant and Appropriate Requirements" (ARARs) for the Site. This list shall be compiled according to established EPA guidance, research of existing regulations, and collection of site-specific information and data. Chemical- and location-specific ARARs are identified early in the process, generally during the site investigation, while action-specific ARARs are usually identified during the Feasibility Study in the detailed analysis of alternatives.

40. Section 6.0 - Schedule (Page 88, 2nd Paragraph)

Second Amended Draft Work Plan

The Second Amended Draft WP identifies the project schedule, which is included as Appendix H. The schedule projects the due date for the following deliverables:

1) Draft RI Report - Due approximately 3 months after the completion of Task 6 (Site Characterization),

2) Draft FS Report - Due approximately 20 months after the completion of Task 6,

3) Draft Baseline Human Health Risk Assessment Report - Due approximately 11 months after the completion of Task 6, and

4) Draft Screening Level Ecological Risk Assessment - Due approximately 9 months after the completion of Task 6.

EPA's Comments

The Draft Final WP shall include a revised project schedule to complete the RI/FS. This revised schedule shall also reflect the schedule of Appendix A (Schedule of Deliverables/Meetings) of the AOC's RI/FS SOW. The projected schedule, included in the Second Amended Draft WP, in which to submit the Draft Feasibility Study (FS) Report, Baseline Human Health Risk Assessment (BHHRA) Report, and the Screening Level Ecological Risk Assessment (SLERA) is excessive and will delay the preparation of the Proposed Plan and Record of Decision for the Site. The Draft FS, BHHRA, and SLERA Reports shall all be completed and submitted to the EPA at approximately the same time frame as the Remedial Investigation Report. The schedule may be revised if a Baseline Ecological Risk Assessment is required. The Draft Final WP shall also include the schedule for submittal of the Final Screening Level Ecological Risk Assessment "Report."

41. References - Page 93

Second Amended Draft Work Plan

The references section of the Second Amended Draft WP includes the references for the text of the deliverable.

EPA's Comments

The references in the text and in the references section of the Second Amended Draft WP (including the FSP and QAPP) shall be reviewed for consistency and revised in the draft final deliverables. Any references not included in the text of the draft final deliverable shall be excluded from the references section of the respective deliverable. The Draft Final WP (including the FSP and QAPP) shall accurately reflect all references throughout their entirety.

Deliverable-Specific Comments
Second Amended Draft Remedial Investigation and Feasibility Study
Field Sampling Plan

The following "Deliverable-Specific Comments" pertain to the EPA's comments on the Second Amended Draft FSP. The deliverable-specific comments are listed numerically by the sections, pages, and paragraphs corresponding to the Second Amended Draft FSP required pursuant to the AOC. A paragraph number corresponds to the sequence of a paragraph within a section.

42. Document Title Page - Header

Second Amended Draft Field Sampling Plan

The header of the Second Amended Draft FSP's title page (and subsequent pages) indicates "Revision 01."

EPA's Comments

The Draft Final FSP shall be revised to indicate "Revision 03."

43. Section 1.0 - Introduction (Page 8, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 1 (Area Map).

EPA's Comments

Figure 1 of the Draft Final FSP shall be revised to depict "FM 361," "FM 2725," and "Bishop Road."

44. Section 1.1 - Phase I Investigation (Page 8, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP briefly describes "Phase I" of the RI/FS.

EPA's Comments

The Draft Final FSP shall be revised to include a detailed discussion of Phases I and II of the Remedial Investigation and Feasibility Study for the Site. Since little information exists on the distribution of chemical risk drivers at the Site, the sampling strategy will have to be carried out in at least two phases. Some prior knowledge of chemical distributions is required before performing statistical calculations to be used in the determination of the minimum number of samples required to meet the objectives of the Remedial Investigation and Feasibility Study for the Site. The EPA does not desire to abandon a contaminated site nor clean up a clean site, and a well developed field sampling plan will limit the possibilities of making these decision errors.

For Phase I, the number of soil, sediment, ground water, and surface water judgmental or random-grid sampling locations was initially determined by the Site Team and is not based on the distribution of the risk drivers, if any, for the Site. Ideally, Phase I would determine the distribution of the risk drivers for the Site. The standard deviation, alpha and beta error rates, width of the gray region, and a threshold value (screening value) can then be used in Phase II as input into Visual Sample Plan software algorithms to statistically determine the minimum number of samples required to meet the Data Quality Objectives for the Site. Appendix A (Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical) is an example of a probabilistic sampling design, prepared from Visual Sample Plan software, that could be applied in Phase II of the RI/FS for the Site. Another scoping meeting will be held to evaluate the data gathered during Phase I and to determine the actions required for Phase II.

For human health and ecological risk assessment screening purposes, any chemicals detected at the Site above their respective screening levels will be carried forward in the risk assessments required by the NCP, taking into account synergistic effects. For ecological risk assessment screening purposes, bioaccumulative chemicals may need to be carried forward in the risk assessment if found below their respective screening levels. For both the human health and ecological risk assessments, the maximum detected concentrations shall be used for risk screening purposes. The statistically derived 95 percent upper confidence limit (UCL) of the arithmetic mean (if the sample size is adequate) or maximum concentration (if the sample size is inadequate), whichever is appropriate for a given medium, will be calculated for use as the concentration term in the risk assessment equations following the risk screening process. The statistical methods described in the EPA's guidance documents for calculating UCLs are based on the assumption of random sampling.

45. Section 1.1.2 - Off-Site Investigation (Page 9, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "The following off-site activities will be performed:
>
> . . . . . .
>
> - Collect judgmental sediment and subsurface soil samples along the active and inactive pipelines that lead to the current and former barge dock facilities; and . . ."

EPA's Comments

The Draft Final FSP shall be revised to state that:

"The following off-site activities will be performed:

. . . . . .

- Collect judgmental sediment and surface/subsurface soil samples along the active and inactive pipelines that lead to the current and former barge dock facilities; and . . ."

46. Section 1.1.2 - Off-Site Investigation (Page 9, 2nd Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

"The Falcon Refinery RI/FS is designed to meet the objectives, however if the objectives are not met with the Phase I objectives a Phase II investigation will be performed, if necessary."

EPA's Comments

The Draft Final FSP shall be revised to include a detailed discussion of Phases I and II of the Remedial Investigation and Feasibility Study for the Site. Since little information exists on the distribution of chemical risk drivers at the Site, the sampling strategy will have to be carried out in at least two phases. Some prior knowledge of chemical distributions is required before performing statistical calculations to be used in the determination of the minimum number of samples required to meet the objectives of the Remedial Investigation and Feasibility Study for the Site. The EPA does not desire to abandon a contaminated site nor clean up a clean site, and a well developed field sampling plan will limit the possibilities of making these decision errors.

For Phase I, the number of soil, sediment, ground water, and surface water judgmental or random-grid sampling locations was initially determined by the Site Team and is not based on the distribution of the risk drivers, if any, for the Site. Ideally, Phase I would determine the distribution of the risk drivers for the Site. The standard deviation, alpha and beta error rates, width of the gray region, and a threshold value (screening value) can then be used in Phase II as input into Visual Sample Plan software algorithms to statistically determine the minimum number of samples required to meet the Data Quality Objectives for the Site. Appendix A (Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical) is an example of

a probabilistic sampling design, prepared from Visual Sample Plan software, that could be applied in Phase II of the RI/FS for the Site. Another scoping meeting will be held to evaluate the data gathered during Phase I and to determine the actions required for Phase II.

For human health risk assessment purposes, any chemicals detected at the Site above their respective screening levels will be carried forward in the risk assessments required by the NCP, taking into account synergistic effects. For ecological risk assessment screening purposes, bioaccumulative chemicals may need to be carried forward in the risk assessment if found below their respective screening levels. For both the human health and ecological risk assessments, the maximum detected concentrations shall be used for risk screening purposes. The statistically derived 95 percent upper confidence limit (UCL) of the arithmetic mean (if the sample size is adequate) or maximum concentration (if the sample size is inadequate), whichever is appropriate for a given medium, will be calculated for use as the concentration term in the risk assessment equations following the risk screening process. The statistical methods described in the EPA's guidance documents for calculating UCLs are based on the assumption of random sampling.

47. Section 1.2 - Phase II Investigation (if necessary) (Page 9, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP briefly describes "Phase II" of the RI/FS and indicates that Phase II will be performed "if necessary."

EPA's Comments

The Draft Final FSP shall be revised to include a detailed discussion of Phases I and II of the Remedial Investigation and Feasibility Study for the Site. Since little information exists on the distribution of chemical risk drivers at the Site, the sampling strategy will have to be carried out in at least two phases. Some prior knowledge of chemical distributions is required before performing statistical calculations to be used in the determination of the minimum number of samples required to meet the objectives of the Remedial Investigation and Feasibility Study for the Site. The EPA does not desire to abandon a contaminated site nor clean up a clean site, and a well developed field sampling plan will limit the possibilities of making these decision errors.

For Phase I, the number of soil, sediment, ground water, and surface water judgmental or random-grid sampling locations was initially determined by the Site Team and is not based on the distribution of the risk drivers, if any, for the Site. Ideally, Phase I would determine the distribution of the risk drivers for the Site. The standard deviation, alpha and beta error rates, width of the gray region, and a threshold value (screening value) can then be used in Phase II as input into Visual Sample Plan software algorithms to statistically determine the minimum number of samples required to meet the Data Quality Objectives for the Site. Appendix A (Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical) is an example of a probabilistic sampling design, prepared from Visual Sample Plan software, that could be

applied in Phase II of the RI/FS for the Site. Another scoping meeting will be held to evaluate the data gathered during Phase I and to determine the actions required for Phase II.

For human health and ecological risk assessment screening purposes, any chemicals detected at the Site above their respective screening levels will be carried forward in the risk assessments required by the NCP, taking into account synergistic effects. For ecological risk assessment screening purposes, bioaccumulative chemicals may need to be carried forward in the risk assessment if found below their respective screening levels. For both the human health and ecological risk assessments, the maximum detected concentrations shall be used for risk screening purposes. The statistically derived 95 percent upper confidence limit (UCL) of the arithmetic mean (if the sample size is adequate) or maximum concentration (if the sample size is inadequate), whichever is appropriate for a given medium, will be calculated for use as the concentration term in the risk assessment equations following the risk screening process. The statistical methods described in the EPA's guidance documents for calculating UCLs are based on the assumption of random sampling.

48. Section 1.3 - Sampling Objectives and Design (Page 10, 4th Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Appendix E (Ecological Benchmarks).

EPA's Comments

The Draft Final FSP shall be revised to reflect Appendix E (Comparison of Quantitation Limits to Ecological Screening Standards). Additionally, the "Comparison of CLP CRQLS to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs" shall be included in a separate appendix, for easy reference, and titled "Comparison of Quantitation Limits to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs." The EPA's Region 6 MSSLs, TCEQ's Tier 1 PCLs, and TCEQ's ecological screening levels have been updated. The Draft Final FSP (including the Draft Final WP and QAPP) shall be revised to include an updated Appendix E. The sources listed in Appendix E shall be revised to reflect the sources discussed in the text of the Draft Final FSP.

For clarification purposes, the chemicals included in Appendix E, of the Second Amended Draft FSP, are derived from the EPA's Contract Laboratory Program (CLP). The CLP is a national network of EPA personnel, commercial laboratories, and support contractors whose fundamental mission is to provide customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies) with analytical data of known and documented quality. The CLP provides its customers with services such as environmental sample analyses. These analytical services are designated as "CLP SOM01.1" for organics and "CLP ILM05.3" for inorganics. The "target compound list" for organics and the "target analyte list" for inorganics, included in Appendix E of the Second Amended Draft FSP, do not include all of the chemicals

that may be of potential concern at the Site (e.g., vinyl acetate, among others). Additionally, the analytical services provided by the CLP are not accessible to Potentially Responsible Parties.

Appendix E, of the Draft Final FSP, shall be revised to include all of the chemicals that may be of potential concern at the Site. These chemicals include, but are not limited to, total polycyclic aromatic hydrocarbons (including the PAHs listed in the TCEQ's 2001 guidance), hexavalent chromium, vinyl acetate, those chemicals analyzed for the HRS Documentation Record, and those chemicals that are associated with refinery processes.

The chemicals listed in the table of Appendix E, of the Second Amended Draft FSP, need to be rearranged in the Draft Final FSP, including the new appendix for the human health screening criteria, for easy reference. The chemicals should be arranged alphabetically by chemical type (e.g., organics [VOCs and SVOCs] and inorganics, etc.).

Appendix E, or the text of the Draft Final FSP, shall identify which risk values will be used in the risk screening process and the appendix shall be modified to reduce the number of significant digits. Additionally, maximum contaminant levels (MCLs) shall be provided in the screening table when available for a particular chemical.

The surface water ecological benchmarks of Appendix E, of the Second Amended Draft FSP, are benchmarks for fresh water. Appendix E, of the Draft Final FSP, shall be revised to include benchmarks for salt water since both fresh water and salt water exist at the Site. Additionally, Appendix E and/or the text of the Draft Final FSP shall provide an explanation of how brackish water will be classified.

Appendix E, of the Draft Final FSP, shall be revised to include benchmark values for marine and freshwater sediments since both are present at the Site. Additionally, Appendix E shall be revised to depict soil and sediment benchmarks separately. Soil and sediment benchmarks should not be combined.

"Footnote 3" of Appendix E, of the Second Amended Draft FSP, states that ecological benchmarks provided below are described in Table 5-5. The Second Amended Draft FSP does not include Table 5-5. The text of Footnote 3 should be deleted from the Draft Final FSP or revised to reflect the appropriate reference.

Appendix E, of the Second Amended Draft FSP, lists the source for several of the benchmarks as the Region 6 Ecological Screening Benchmark Tables. The EPA Region 6 Ecological Screening Benchmark Tables shall not be used for this RI/FS. These benchmarks have not been peer reviewed and are outdated. The primary source of ecological benchmark values will be the TCEQ 2006 ecological screening benchmarks. If a COPC is not listed in the TCEQ ecological screening benchmark tables, then a search for additional sources of benchmark values will be conducted, and the source of the benchmark values will be documented so that details of how the benchmark values were developed can be verified. If a benchmark is not

proposed, then the COPC will be retained and evaluated further during the baseline ecological risk assessment. The Draft Final FSP (including the WP and QAPP) shall be revised accordingly.

Appendix E, of the Draft Final FSP, shall list primary literature searches, for benchmark values other than TCEQ ecological benchmarks (since these are already referenced), so that details on how the benchmark values were developed can be researched and verified.

The text of the Draft Final FSP shall discuss how chemicals will be treated if their respective quantitation limit is greater than the appropriate benchmark.

49. Section 2.1 - Physical Profile (Page 11, 2nd Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 2 (Site Map).

EPA's Comments

Figure 2, of the Second Amended Draft FSP, does not reflect the correct locations for the historic barge dock nor the pipelines leading to this barge dock. Figure 2, of the Draft Final FSP, shall be replaced with the pipeline map recently provided to the EPA's On-Scene Coordinator for the ongoing removal action. Additionally, this map, or another map, shall identify the ownership of the pipelines which shall include NORCO's pipelines leading to the current and historic barge docks.

50. Section 2.1.1 - North Site (Page 11, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 3 (North Site Map).

EPA's Comments

Figure 3, of the Draft Final FSP, shall include the half buried concrete tank shown on previous maps submitted by NORCO and shall identify the acronym "AOC-1N." Additionally, this acronym shall be identified in all maps included in the Draft Final FSP (including the Draft Final WP and QAPP).

51. Section 2.2 - Facility Profile (Page 15, 16th Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "On July 22, 1992, the Texas Natural Resource Conservation Commission . . . issued a letter to Mr. Dickey Henderson . . . ."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "On July 29, 2002, the Texas Natural Resource Conservation Commission . . . issued a letter to Mr. Dickey Henderson . . . ."

52. Section 2.3 - Areas of Concern (Page 16, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 6 (AOC Map).

EPA's Comments

Figure 6, of the Second Amended Draft FSP, does not reflect the correct locations for the historic barge dock nor the pipelines leading to this barge dock. Figure 6, of the Draft Final FSP, shall be replaced with the pipeline map recently provided to the EPA's On-Scene Coordinator for the ongoing removal action. Additionally, this map, or another map, shall identify the ownership of the pipelines which shall include NORCO's pipelines leading to the current and historic barge docks.

53. Section 2.3.3 - AOC-3 Wetlands (Page 17, 3rd Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "Assessment activities in the wetlands will evaluate the locations of two pipeline releases and assess sediment and soil in the vicinity of the pipelines that lead to the current and former barge dock facilities."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Assessment activities in the wetlands will evaluate releases from the refinery, including the unpermitted wastewater effluent discharge into the wetlands, releases into the wetlands from two known pipeline releases, and the possible releases from the pipelines leading from the refinery to the current and former barge dock facilities."

54. Section 2.3.5 - AOC-5 Redfish Bay (Page 18, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 11 (AOC-5 Redfish Bay).

EPA's Comments

Figure 11, of the Draft Final FSP, shall be revised to depict the correct location of the former barge dock facility.

55. Section 2.3.6 - AOC-6 Thayer Road (Page 18, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 12 (AOC-6 Thayer Road).

EPA's Comments

The EPA believes that the area depicted in Figure 12, of the Second Amended Draft FSP, for the residential areas on Bishop/Thayer Road encompasses a much larger area than necessary for this phase of the RI/FS. The Draft Final FSP shall be revised to depict the area immediately adjacent to the intersection of Bishop and Thayer Roads. This area will be expanded if residential soils are found to be impacted and/or groundwater contamination is discovered at the North or South Site boundaries. If this is the case, the risk assessment will need to evaluate "vapor intrusion" for the residential areas.

56. Section 2.3.7 - AOC-7 Bishop Road (Page 18, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 13 (AOC-7 Bishop Road).

EPA's Comments

The EPA believes that the area depicted in Figure 13, of the Second Amended Draft FSP, for the residential areas on Bishop Road encompasses a much larger area than necessary for this phase of the RI/FS. The Draft Final FSP shall be revised to depict the area immediately adjacent to Bishop Road and the North Site. This area will be expanded if residential soils are found to be impacted and/or groundwater contamination is discovered at the North Site boundary. If this is the case, the risk assessment will need to evaluate "vapor intrusion" for the residential areas.

57. Section 2.5 - Release Profile (Page 19, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figures 14 and 15 (Human Health and Ecological Conceptual Site Model and Exposure Pathways, respectively). Figure 14 states that:

> "• = Pathway identified for elevation in the human health risk assessment.
>
> o = Identified as a low potential for exposure. Pathway not identified for evaluation in the human health risk assessment."

EPA's Comments

Figure 14, of the Draft Final FSP, shall be revised to include, in addition to the flow diagrams, the conceptual site models in schematic format which is easily understood by the public. Appendix B (Example Schematic Ecological Conceptual Site Model) provides an example of a schematic of an ecological conceptual site model that could be appropriate for this Site and would be easily understood by the public. The Draft Final FSP shall include a similar schematic for the human health conceptual site model.

Additionally, the trespasser scenario shall consider someone who trespasses on-site and uses the wetlands for fishing since they may consume fish from the wetland areas. The trespasser scenario shall also include off-site sediment and surface water in the wetland area since a trespasser is likely to wander into both on- and off-site areas. The conceptual site model shall also be revised to depict leaks and spills as a primary release mechanism to the on- and off-site wetlands and to depict the fish ingesting fish/shellfish pathway for releases from the dock facilities into marine/coastal waters. The conceptual site model shall also consider that mammals, birds, and reptiles could be indirectly exposed to site COPECs due to the ingestion of soil and sediment invertebrates and plants. It appears that Figure 14 currently only reflects the direct exposure pathways.

Figure 15, of the Draft Final FSP, shall be revised to exclude the text concerning "Receptor Exposure Scenarios" and the graphics portion of the figure shall be enlarged to encompass the entire figure. Appendix B (Example Schematic Ecological Conceptual Site Model) provides an example of a schematic of an ecological conceptual site model that could be appropriate for this Site and would be easily understood by the public. The schematic of the ecological conceptual site model included in the Second Amended Draft FSP does not adequately depict the exposure pathways and receptors. The Draft Final FSP shall also include a similar schematic for the human health conceptual site model. Additionally, the revised Figure 15 shall be included in the Draft Final WP and QAPP, and shall be renamed "Schematic Ecological Conceptual Site Model." Another figure shall be renamed "Schematic Human Health Conceptual Site Model."

Figure 14, of the Draft Final FSP, shall be revised to state that:

> "• = Pathway identified for evaluation in the human health and ecological risk assessments.
>
> o = Identified as a low potential for exposure. Pathway not identified for evaluation in the human health risk and ecological risk assessments."

58. Section 2.5.3 - Releases to Sediment and Surface Water (Page 20, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "Releases to surface water and sediments may have occurred as a result of runoff from contaminated surface soils, overflow from tanks, or spills directly into the wetlands from pipelines."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Releases to surface water and sediments may have occurred as a result of runoff from contaminated surface soils, overflow from tanks, direct discharge from the unpermitted wastewater treatment system, or spills directly into the wetlands from pipelines. Releases could also occur where impacted ground water interfaces with these media."

59. Section 2.6 - Receptor Profile (Page 20, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "Limited sampling for PCB's and pesticides/herbicides will be performed in AOC-1 and AOC-4."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Limited sampling for PCB's and pesticides/herbicides will be performed in AOC-1, AOC-3 (in the wetland area located immediately southeast of the refinery and bounded by Bishop Road and Bay Avenue), AOC-4, AOC-6, and AOC-7."

Additionally, Table 2 (Sampling Design) and any associated maps, of the Draft Final FSP, shall be revised accordingly.

60. Section 2.6.1.1 - Soil Related Human Exposure Pathways (Page 21, 3rd Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "If gardens are identified during the Phase I off-site residential soil sampling, the CSM may be modified . . . ."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Gardens will be assumed to exist in the residential areas of the Site and will be considered in the Conceptual Site Model, along with the possibility that children play in the yard and could be exposed to contaminated soils."

61. Section 2.6.2 - Ecological Exposure Pathways and Receptors (Page 22, 2nd and 6th Paragraphs)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> ". . . the current ecological receptors at potential risk are primarily off-site terrestrial wildlife."
>
> . . . . . .
>
> "Although potentially suitable habitat for these special-status species occurs on and adjacent to the project site it does not guarantee the presence or optimum use of special-status species. Additional species-specific focused surveys will be needed to ascertain this data."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> ". . . the current ecological receptors at potential risk are primarily off-site terrestrial and aquatic wildlife.
>
> . . . . . .
>
> Although potentially suitable habitat for these special-status species occurs on and adjacent to the project site, it does not guarantee the presence or optimum use of special-status species. Additional species-specific focused surveys will be needed to ascertain this data.
>
> Both federally-listed and state-listed species shall be addressed in the ERA. In order to eliminate a threatened/endangered species as being potentially present, an ERA will provide supporting documentation from a wildlife management agency to confirm the absence of the protected species on the affected property. If this is not possible due to the time constraints associated with the project, a discussion will be provided for the lack of suitable habitat by comparing the available habitat with the habitat needs of threatened/endangered species that could possibly occur in the county. It will not be enough to simply assume that no protected species are known to occur at the Site.

If the presence or absence of a protected species cannot be determined, then the species will be considered as being present and potentially impacted. For species known to use the area or suspected to use the area due to habitat suitability, the ERA must then demonstrate through exposure or action level determination that the species will either not be impacted, or that protective clean up levels will be developed. These demonstrations are usually accomplished by calculating the exposure and evaluating the risk to a receptor that is a surrogate (a receptor from the same feeding guild) for the protected species. In this case, the ERA should also explain why the particular receptor chosen is a suitable surrogate for the sensitive species. Finally, where a protected species is known to occur or could possibly occur at the Site based on habitat suitability, any cleanup levels should be based on the NOAEL toxicity reference value (TRV)."

62. Section 2.6.2.2 - Ground Water Related Ecological Exposures (Page 23, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

"No complete ecological exposures to ground water are known."

EPA's Comments

For clarification purposes, if it is determined during the initial sampling that there is a likely release of impacted ground water to surface water, the ground water-to-sediment pathway shall also be considered. In this case, sediment samples shall be collected and analyzed in the area of upwelling or release of impacted ground water. Comparison of ground water concentrations to surface water criteria is not necessarily a good assessment of potential impacts to sediment in the area of the ground water release. In this case, the evaluation can be supported by the sampling and analysis of sediment samples collected in the area of the interface.

63. Section 2.6.2.3 - Surface Water and Sediment Related Ecological Exposures (Page 23, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

"Immediately adjacent to the Site is a wetlands (AOC-3) that drains into Redfish Bay (AOC-5) potential concerns are addressed in Section 2.6.2.1 [Soil Related Direct Ecological Exposures]."

EPA's Comments

This section of the Second Amended Draft FSP does not provide an explanation of the surface water and sediment-related ecological exposure pathways and neither does Section 2.6.2.1. This section of the Draft Final FSP shall be revised to provide an explanation of the surface water and sediment-related ecological exposure pathways. Aquatic and terrestrial exposure pathways are very different in nature and should not be addressed as though they are the same.

64. Section 2.6.2.4 - Dietary Ecological Exposures (Page 23, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "In addition, the lines between media definition blur somewhat for the wetlands as perennial water cover is not present thus, the underlying 'sediment' may be considered soil, particularly during certain times of the year."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Federal agencies define wetland sediments based on several attributes, including but not limited to, 'the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of the year.' The substrate in the marsh or wetlands adjacent to the Site therefore shall be treated as sediment for this RI/FS, even if it is not covered by overlying water during the entire year. This means all screening values used for comparison shall be sediment values, with the understanding that terrestrial receptors would also have to be evaluated since both aquatic and terrestrial receptors could be exposed to contaminants during periods of inundation and dry periods, respectively."

65. Section 3.0 - Sampling Objectives (Page 25, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "As stated in the DQOs for this project, the following study question was formulated for the Site RI:

> Where do levels of preliminary COPCs exist either on or off-site at concentrations above risk-based screening levels (RBSL) and/or background mean concentrations along complete exposure pathways for relevant exposure scenarios?"

The Draft Final FSP shall be revised to state that:

> "As stated in the DQOs for this project, the following study question, included the Quality Assurance Project Plan, was formulated for the Site RI:
>
> > Where do levels of preliminary COPCs exist either on or off-site at concentrations above or below risk-based screening levels (RBSL) and/or background concentrations along complete exposure pathways for relevant exposure scenarios?"

66. Section 3.0 - Sampling Objectives (Page 25, 5th Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "The strategy for characterizing the site contamination . . . are based on the following media-specific screening levels:
>
> - EPA Region 6 human health MSSLs for human health risk screening of soil, groundwater, and sediment (as soil) (EPA 2002a). Groundwater ingestion pathways will apply only if the shallow aquifer is of sufficient yield and natural quality to constitute a potable water supply. Soil screening levels (assuming the dilution/attenuation factor of 20 as suggested by the EPA Soil Screening Level guidance document) will be used to evaluate soil-to-groundwater migration potential.
> - TCEQ and EPA Region 6 medium-specific ecological benchmarks for ecological screening of soil, sediment and surface water.
>
> . . . . . .
>
> - Texas Surface Water Quality Criteria for human health surface water screening."

EPA's Comments

The Draft Final FSP shall be revised to state:

> "The strategy for characterizing the site contamination . . . are based on the following media-specific screening levels:
>
> - EPA Region 6 human health MSSLs for human health risk screening of soil and groundwater. Groundwater ingestion pathways will only apply, upon consultation with the EPA and TCEQ, if the shallow aquifer is of sufficient yield and natural quality to constitute a potable water supply. Soil screening levels (assuming the dilution/attenuation factor of 10 as suggested by the EPA Soil Screening Level guidance document) will be used to evaluate soil-to-groundwater migration potential.
>
> - TCEQ ecological benchmarks for ecological screening of soil, sediment and surface water.
>
> . . . . . .
>
> - Texas and Federal Surface Water Quality Criteria for human health surface water screening.
>
> - Applicable or Relevant and Appropriate Requirements."

The soil screening guidance recommends a dilution attenuation factor (DAF) for areas ½ acre in size or smaller. For larger areas, a DAF of 10 is recommended. Additional information will be needed to justify the use of a DAF of 20 for the refinery.

67. Section 3.2 - On-Site Random Grid Locations (Page 27, 4th Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 20 (AOC-2 Composite Sample Locations) and states that:

> "Random-start systematic grid sampling is considered 'unbiased' and appropriate for application of statistics in assessing potential exposure concentrations . . . . If a laboratory analysis results in concentrations above the screening level from the composite sampling then additional sampling will be recommended."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Although the selection of the 'number' of sampling locations was not based on statistics and determined by the Site Team, random-start systematic grid sampling is considered 'unbiased' and appropriate for application of statistics in assessing potential exposure concentrations . . . . If a laboratory analysis results in concentrations above or near the screening level from the composite sampling then additional sampling may be recommended in Phase II of the RI/FS."

Figure 20, of the Second Amended Draft FSP, is difficult to read, even in electronic format. Figure 20 of the Draft Final FSP shall be revised to legibly show the four composite sampling areas.

68. Section 3.3 - On-Site Ground Water Locations (Page 27, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 22 (AOC-1S Temporary Monitor Wells) and the location of Temporary Monitor Well TW01-41, and states that:

> "If the temporary wells demonstrate that significant groundwater contamination exists, permanent groundwater wells will be installed to provide additional water quality data as well as basic hydrologic data."

EPA's Comments

Figure 22, of the Draft Final FSP, shall be revised to show the revised location of Monitor Well TW01-41. This well shall be moved to the area between the aeration pond and the wetland area located immediately southeast of the refinery and bounded by Bishop Road and Bay Avenue. This location/area is assumed to be the predominantly downgradient direction of ground water flow.

The Draft Final FSP shall be revised to state that:

> "If the temporary wells demonstrate that groundwater contamination exists, a decision will be made in Phase II of the RI and permanent groundwater wells may be installed to provide additional water quality data as well as basic hydrologic data."

69. Section 3.4 - Off-Site Random Grid Locations (Page 28, 1st and 3rd Paragraphs)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "Random-start systematic grid sampling is considered 'unbiased' and appropriate for application of statistics in assessing potential exposure concentrations . . . .
>
> . . . . . .
>
> Samples will be obtained from the sediments in the 0.0 to 0.5 foot interval and will be analyzed in a fixed laboratory for metals, VOC, SVOC, PCB and pesticide/herbicides as shown in Table 2."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Although the selection of the 'number' of sampling locations was not based on statistics and determined by the Site Team, random-start systematic grid sampling is considered 'unbiased' and appropriate for application of statistics in assessing potential exposure concentrations . . . .
>
> . . . . . .
>
> Samples will be obtained from the sediments, or soils if the random wetland location is not inundated, in the 0.0 to 0.5 foot interval and will be analyzed in a fixed laboratory for metals, VOCs, SVOCs, PCBs and pesticides/herbicides as shown in Table 2. Additionally, a surface water sample will be obtained from each sediment sampling location in AOC-3 and AOC-5, before the sediment sample is taken."

For clarification purposes, federal agencies define wetland sediments based on several attributes, including but not limited to, "the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of the year." Therefore, the substrate in the marsh or wetlands adjacent to the Site shall be treated as sediment for this RI/FS, even if it is not covered by overlying water during the entire year. This means all screening values used for comparison shall be sediment values, with the understanding that terrestrial receptors would also have to be evaluated since both aquatic and terrestrial receptors could be exposed to contaminants during periods of inundation and dry periods, respectively.

70. Section 3.5 - Off-Site Judgmental Sampling (Page 28, 1st and 3rd Paragraphs)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figures 23 (AOC-3 Sample Locations) and 24 (AOC-5 Sample Locations).

EPA's Comments

Figure 23, of the Draft Final FSP, shall be revised to show the additional and revised judgmental sampling locations depicted on Appendix C (Additional and Revised Judgmental Sampling Locations) of the EPA's comments. The purpose of these sampling locations is to characterize the known historic and recent pipeline spills/cuts and specific surface water, soil, and sediment locations. Judgmental samples J-47SD and J-48SD shall be moved to the locations depicted in Appendix C. The collection of samples from Sample Locations 1 thru 7 shall follow the soil sampling protocols discussed in the FSP. Sediment sampling protocols shall be followed if these sampling locations are indundated. Figure 24, of the Draft Final FSP, shall be revised to depict the correct location of the former barge dock facility. Judgmental Sample J-51SD shall be moved accordingly and correctly depicted on Figure 24.

71. Section 3.5 - Off-Site Judgmental Sampling (Page 28, 4th Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 26 (AOC-7 Sample Locations).

EPA's Comments

Figure 26, of the Draft Final FSP, shall be revised to show the revised location for Judgmental Sample J-55S. Judgmental Sample J-55S shall be moved to the location half the distance from Judgmental Sample J-56S and FM 2725 and parallel to Bishop Road. The purpose of these sampling locations is to characterize any possible releases from the North Site. Figure 26 shall be revised accordingly.

72. Section 3.5 - Off-Site Judgmental Sampling (Page 28, 7th Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 27 (Background Sample Locations) and states that:

> "There are 2 background sample locations (BG-01SD and BG-02S), one will be used to sample sediment and soil at locations that have not been impacted by the Site (Figure 27)."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Background sample locations will be used to sample sediment, soil, and surface water at locations that have not been impacted by the Site and have similar characteristics to the Site's sediment, soil, and surface water (Figure 27 - Background Sample Locations)."

For clarification purposes, background samples should be collected concurrently with the other samples in order to provide an appropriate comparison with which to characterize the nature and extent of potential contamination of the Site. These background samples should be taken at appropriate reference locations, specific to each medium to be sampled, and should be abundant enough to provide adequate reference points. This is particularly important for sediment samples, which are inherently variable due to the physico-chemical properties of aquatic systems.

The procedures for determining background concentrations are described in the EPA's guidance documents entitled "Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites" (Office of Solid Waste and Emergency Response, EPA/540/5-96/500, December 1995) and "Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites" (EPA 540-R-01-003, 2002). NORCO shall continue discussions with the EPA concerning the number and locations of background for the Site. Discussion topics shall include comparability of soil/sediment types, comparability of physical and geochemical characteristics, land use history, and predominant wind direction relative to the Site. Figure 27, of the Draft Final FSP, shall be revised accordingly after these discussions.

73. Section 3.6 - Off-Site Surface Water Samples (Page 29, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "Three off-site surface water samples will be obtained at the site and analyzed for metals, VOC, SVOC, PCB and pesticides/herbicides. Two of the samples will be obtained in the wetlands and one sample will be obtained from the bay adjacent to the current barge dock facility. The specific sampling locations will be selected based on surface water conditions at the time of sampling.

The wetlands adjacent to the site are frequently dry and change configuration. Prior to sampling the RPM will be notified of the selected sampling locations."

EPA's Comments

The Draft Final FSP shall be revised to state that:

"Surface water samples will be obtained at the site and analyzed for metals, VOCs, SVOCs, PCBs and pesticides/herbicides. These surface water samples will be obtained from each sediment sampling location in AOC-3 and AOC-5, before the sediment sample is taken. Additionally, surface water samples will be taken from each of the judgmental sediment sampling locations depicted in Appendix C (Additional and Revised Judgmental Sampling Locations). The specific sampling location will be selected based on surface water conditions at the time of sampling.

The wetlands adjacent to the site are frequently dry and change configuration. Prior to sampling the RPM will be notified of the selected sampling locations."

Table 2 (Sampling Design), of the Draft Final FSP (including the figures of the Draft Final FSP, WP, and QAPP), shall be revised accordingly.

74. Section 3.8 - Site Characteristics (Page 29, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

"The following additional data will be collected to refine the CSM:

. . . . . .

- Screening data for use in confirming the presence of preliminary COPCs collected from soil borings.

Definitive ground water data collected from monitoring wells that can be used to support a risk assessment and FS."

EPA's Comments

The Second Amended Draft FSP shall be revised to state that:

"The following additional data will be collected to refine the CSM:

. . . . . .

- Screening data for use in confirming the presence of preliminary COPCs collected from soil borings, and

- Definitive ground water data collected from monitoring wells that can be used to support a risk assessment and FS."

75. Section 4.0 - Field Investigation (Page 30, 2nd Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "Samples will be analyzed by Severn Trent Laboratories (STL) using Contract Laboratory Program (CLP) protocols. STL will use CLP analytical methods (EPA 2004 IlM05.3, EPA 2006 SOM01.1) for the isolation, detection, and quantitation of specific target compounds and analytes, both the CLP method name and a similar or equivalent EPA SW-846 Method (if applicable) (EPA 1996) are referenced in the FSP and QAPP."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Samples will be analyzed by Severn Trent Laboratories (STL) using appropriate analytical methods for the isolation, detection, and quantitation of specific target compounds and analytes. The applicable analytical methods (e.g, EPA SW-846 or equivalent) are referenced in the FSP and QAPP."

For clarification purposes, the EPA's Contract Laboratory Program (CLP) is a national network of EPA personnel, commercial laboratories, and support contractors whose fundamental mission is to provide customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies) with analytical data of known and documented quality. The CLP provides its customers with services such as environmental sample analyses. These analytical services are designated as "CLP SOM01.1" for organics and "CLP ILM05.3" for inorganics. The "target compound list" for organics and the "target analyte list" for inorganics, included in each of the appendices of NORCO's deliverables, do not include all of the chemicals that may be of potential concern at the Site (e.g., vinyl acetate, among others). Additionally, the analytical services provided by the CLP are not accessible to Potentially Responsible Parties.

76. Section 4.2.1.1 - On-Site Judgmental and Random Grid Surface Soil Samples (Page 31, 1st and 2nd Paragraphs)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Table 2 (Sampling Design) and states that:

> "Judgmental samples will be located at 43 judgmental sample locations in AOC-1 to address . . . ."

EPA's Comments

The title block of Table 2, of the Amended Draft FSP, depicts "up to 42 locations." Table 2 of the Draft Final FSP shall depict "up to 43 locations."

77. Section 4.2.2 - On-Site Subsurface Soil Sampling (Page 31, 5th Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "One subsurface soil sample will be collected at each grid location Geoprobe® boring from the interval with the highest PID reading or other indication of contamination recorded. In the event that no evidence of contamination is noted, the sample will be collected from groundwater interface. However, if the groundwater interface is deeper than five feet then the sample will be obtained at five feet."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "One subsurface soil sample will be collected at each grid location Geoprobe® boring from the interval with the highest PID reading or other indication of contamination recorded. In the event that no evidence of contamination is noted, the sample will be collected from the groundwater interface."

78. Section 4.3 - On-Site Ground Water Sampling (Pages 32 and 33, 3rd, 4th, and 7th Paragraphs)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

"If temporary well results indicate that (1) site-wide conditions statistically exceed appropriate risk-based concentrations (such as Region 6 MSSLs properly adjusted for EPA groundwater classification) and that (2) measured downgradient temporary well results statistically exceed concentrations in temporary upgradient wells, permanent monitoring wells will be installed to assess representative concentrations and trends.

. . . . . .

If well data indicate that no site-related COPCs exceed MSSLs or otherwise do not meet the DQO decision criteria, no permanent monitor wells will be installed. Further delineation of groundwater contaminants will be reserved pending the results of the shallow aquifer assessment.

. . . . . .

Deeper WBZs will only be evaluated if overlying WBZs are found to be significantly contaminated above appropriate MSSLs, ..."

EPA's Comments

The Draft Final FSP shall be revised to state that:

"If temporary well results indicate that contaminants are detected above or near the appropriate screening levels, permanent monitoring wells may be installed to assess representative concentrations and trends. These decisions will be made during the Phase II RI.

. . . . . .

If well data indicate that no site-related COPCs have been detected or otherwise do not meet the DQO decision criteria, then no permanent monitor well may be installed. Further delineation of groundwater contaminants will be reserved pending Phase II discussions concerning the results of the Phase I shallow aquifer assessment.

. . . . . .

Deeper WBZs will be evaluated further, in Phase II, if chemicals are detected in overlying WBZs, whether above or below appropriate MSSLs or chemical-specific ARARs, ..."

79. Section 4.4.2 - Background Sampling (Page 35, 3rd Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Figure 27 (Background Sample Locations) and background sample locations BG-1SD and BG-2SD.

EPA's Comments

For clarification purposes, background samples should be collected concurrently with the other samples in order to provide an appropriate comparison with which to characterize the nature and extent of potential contamination of the Site. These background samples should be taken at appropriate reference locations, specific to each medium to be sampled, and should be abundant enough to provide adequate reference points. This is particularly important for sediment samples, which are inherently variable due to the physico-chemical properties of aquatic systems.

The procedures for determining background concentrations are described in the EPA's guidance documents entitled "Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites" (Office of Solid Waste and Emergency Response, EPA/540/5-96/500, December 1995) and "Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites" (EPA 540-R-01-003, 2002). NORCO shall continue discussions with the EPA concerning the number and locations of background for the Site. Discussion topics shall include comparability of soil/sediment types, comparability of physical and geochemical characteristics, land use history, and predominant wind direction relative to the Site. The text of Figure 27, of the Draft Final FSP, shall be revised accordingly after these discussions.

80. Section 4.4.3 - Off-Site Sediment and Surface Water Sampling (Pages 35 and 36, 1st, 2nd, and 3rd, and 5th Paragraphs)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "The judgmental sampling will be performed along the pipeline that connects the refinery to the barge dock facility and at the site of a pipeline release in the wetlands.
>
> The sediment samples from Redfish bay will be judgmental to determine if there are COPCs associated with the barge dock facility.

> Three surface water samples will be obtained from the wetlands, if there is water, and one will be obtained from Redfish Bay.
>
> . . . . . .
>
> Sediment samples will be collected . . . with a . . ., Sludge Judge®, long-handled dipper, ..."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "The judgmental sampling will be performed along the pipeline that connects the refinery to the current and historic barge dock facilities, the barge dock facilities on the Intracoastal Canal, the wetlands in AOC-3, the locations of known pipeline releases in the wetlands, and at the culvert outlet draining into the Intracoastal Canal.
>
> The sediment samples from Redfish bay will be judgmental to determine if there are COPCs associated with the current and historic barge dock facilities and the culvert draining into the Intracoastal Canal. Surface water samples will also be obtained from each of the sediment sampling locations.
>
> Surface water samples will be obtained from each of the sediment sampling locations in AOC-3 and AOC-5."

The Draft Final FSP, WP, and QAPP shall be revised to reflect these samples locations. Additionally, using a Sludge Judge® to sample sediment is not recommended since this type of equipment is generally used to measure or sample settleable (suspended) solids found in sewage treatment plants, waste settling ponds, and impoundments containing waste. The EPA's 2001 guidance document entitled "Methods for the Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analyses" (Technical Manual, Office of Water, EPA-823-B-01-002, October 2001) and TCEQ's 2003 guidance document entitled "Surface Water Quality Monitoring Procedures" (Volume 1; Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue; RG-415; December 2003) provide guidance for sampling sediment. Additionally, TCEQ's 2001 guidance document (Ecological Risk Assessment Guidance) provides discussions regarding the appropriate sample depth for sediment sampling.

81. Section 5.0 - Sample Designations (Page 37, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP states that:

> "In addition Forms II Lite Version 5.1 will be used to provide sample tracking."

EPA's Comments

The EPA stated, in previous comments concerning NORCO's draft deliverables, that Forms II Lite software shall be used for this RI/FS. After further inquiry, the EPA has determined that use of this software is optional at the discretion of the PRP.

82. Section 6.3.2 - Sediment Sampling (Page 42, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies SOP No. 32 (Sediment Sampling) and states that:

> "Wetland and Redfish Bay sediments will be collected with a hand core sampler, slide hammer sampler, dedicated Sludge Judge®, or long-handled dipper. These samples will be collected as site-specific conditions warrant. Sampling will be performed according to SOP No. 32, depending on site-specific conditions."

EPA's Comments

SOP No. 32 of the Second Amended Draft FSP also includes "Geoprobe Sampling." The Draft Final FSP shall be revised to reflect SOP No. 42 for "Geoprobe Sampling" as shown in Table 3 (Standard Operating Procedures).

Using a Sludge Judge® to sample sediment is not recommended since this type of equipment is generally used to measure or sample settleable (suspended) solids found in sewage treatment plants, waste settling ponds, and impoundments containing waste. The EPA's 2001 guidance document entitled "Methods for the Collection, Storage, and Manipulation of Sediments for Chemical and Toxicological Analyses" (Technical Manual, Office of Water, EPA-823-B-01-002, October 2001) and TCEQ's 2003 guidance document entitled "Surface Water Quality Monitoring Procedures" (Volume 1; Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue; RG-415; December 2003) provide guidance for sampling sediment. Additionally, TCEQ's 2001 guidance document (Ecological Risk Assessment Guidance) provides discussions regarding the appropriate sample depth for sediment sampling.

83. Section 7.1.1 - Sample Container, Volume, Preservatives, and Holding Times Requirements (Page 49, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Table 4 (Sample Volume Requirements).

EPA's Comments

Table 4, of the Draft Final FSP, shall be revised to exclude references to CLP SOM01.1. and CLP ILM05.3. These references refer to analytical services provided by the EPA's Contract Laboratory Program (CLP) to CLP customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies). These analytical services are not accessible to Potentially Responsible Parties. Additionally, Table 4 shall be revised to include the specific analytical method that will be used for the analyses of soil/sediment and aqueous samples.

84. Section 7.2 - Sample Analysis (Page 49, 1st and 2nd Paragraphs)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP identifies Table 5 (Analytical Laboratory Methods) and states that:

> "Kleinfelder has requested that a CLP flexibility clause be implemented to acquire the lowest possible COPC detection limits to evaluate the data against human health and ecological risk-based screening levels."

EPA's Comments

The Draft Final FSP shall be revised to state that:

> "Kleinfelder will require that the laboratory chosen to perform the analytical work for the Site acquire the lowest possible COPC quantitation limits to evaluate the data against human health and ecological risk-based screening levels."

Table 5, of the Draft Final FSP, shall be revised to exclude references to CLP SOM01.1, CLP ILM05.3, and flexibility clauses. These references refer to analytical services provided by the EPA's Contract Laboratory Program (CLP) to CLP customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies). These analytical services are not accessible to Potentially Responsible Parties. Additionally, Table 5 shall be revised to include the specific analytical method that will be used for the analyses of soil/sediment and aqueous samples.

85. Section 8.0 - Schedule (Page 53, 1st Paragraph)

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP provides a brief summary of the project schedule. The project schedule, included in the Second Amended Draft FSP, projects the due date for the following deliverables:

1) Draft RI Report - Due approximately 3 months after the completion of Task 6 (Site Characterization),

2) Draft FS Report - Due approximately 20 months after the completion of Task 6,

3) Draft Baseline Human Health Risk Assessment Report - Due approximately 11 months after the completion of Task 6, and

4) Draft Screening Level Ecological Risk Assessment - Due approximately 9 months after the completion of Task 6.

EPA's Comments

The Draft Final FSP shall include the revised project schedule, included in the Draft Final WP, to complete the RI/FS. This revised schedule shall also reflect the schedule of Appendix A (Schedule of Deliverables/Meetings) of the AOC's RI/FS SOW. The projected schedule, included in the Second Amended Draft WP, in which to submit the Draft Feasibility Study (FS) Report, Baseline Human Health Risk Assessment (BHHRA) Report, and the Screening Level Ecological Risk Assessment (SLERA) is excessive and will delay the preparation of the Proposed Plan and Record of Decision for the Site. The Draft FS, BHHRA, and SLERA Reports shall all be completed and submitted to the EPA at approximately the same time frame as the Remedial Investigation Report. The schedule may be revised if a Baseline Ecological Risk Assessment is required. The Draft Final FSP shall also include the schedule for submittal of the Final Screening Level Ecological Risk Assessment "Report."

86. Section 9.0 - References

Second Amended Draft Field Sampling Plan

The Second Amended Draft FSP, submitted subsequent to the initial submittals of July 7, 2006, does not include a "references" section.

EPA's Comments

The Draft Final FSP shall be revised to include a "references" section. Additionally, the references in the text and in the references section of the Draft Final FSP (including the WP and QAPP) shall be reviewed for consistency and revised in the draft final deliverables. Any references not included in the text of the draft final deliverable shall be excluded from the references section of the respective deliverable. The Draft Final FSP (including the WP and QAPP) shall accurately reflect all references throughout their entirety.

Deliverable-Specific Comments
Second Amended Draft Remedial Investigation and Feasibility Study
Quality Assurance Project Plan

The following "Deliverable-Specific Comments" pertain to the EPA's comments on the Second Amended Draft QAPP. The deliverable-specific comments are listed numerically by the sections, pages, and paragraphs corresponding to the Second Amended Draft QAPP required pursuant to the AOC. A paragraph number corresponds to the sequence of a paragraph within a section.

87. Document Title Page - Header

Second Amended Draft Quality Assurance Project Plan

The header of the Second Amended Draft QAPP's title page (and subsequent pages) indicates "Revision 01" and Q-Trak #00-000.

EPA's Comments

The Draft Final QAPP shall be revised to indicate "Revision 03" and Q-Trak # 07-085. The QTRAK # is assigned by the EPA's regional quality assurance staff for internal tracking purposes.

88. Table of Contents - Sections A7.2.3.1 thru A7.2.3.3 (Page 3)

Second Amended Draft Quality Assurance Project Plan

The "Table of Contents" of the Second Amended Draft QAPP identifies Sections A7.2.3.1 thru A7.2.3.3 applicable to the QAPP.

EPA's Comments

The text of the "Table of Contents" section of the Second Amended Draft QAPP incorrectly identifies Sections A7.2.3.1 thru A7.2.3.3. The Draft Final QAPP shall be revised to reflect the entire text for the title of each section of the QAPP.

89. Section A4.1 - Task Organization (Page 12, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "The EPA's Remedial Project Manager . . . for activities conducted under the Agreed Order on Consent."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "The EPA's Remedial Project Manager . . . for activities conducted under the Administrative Order on Consent."

90. Section A5.1 - Problem Definition (Pages 16 and 17, 1st and 2nd Paragraphs)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP provides a brief discussion of the proposed Phase I and Phase II sampling activities.

EPA's Comments

The Draft Final QAPP shall be revised to include a detailed discussion of Phases I and II of the Remedial Investigation and Feasibility Study for the Site. Since little information exists on the distribution of chemical risk drivers at the Site, the sampling strategy will have to be carried out in at least two phases. Some prior knowledge of chemical distributions is required before performing statistical calculations to be used in the determination of the minimum number of samples required to meet the objectives of the Remedial Investigation and Feasibility Study for the Site. The EPA does not desire to abandon a contaminated site nor clean up a clean site, and a well developed field sampling plan will limit the possibilities of making these decision errors.

For Phase I, the number of soil, sediment, ground water, and surface water judgmental or random-grid sampling locations was initially determined by the Site Team and is not based on the distribution of the risk drivers, if any, for the Site. Ideally, Phase I would determine the distribution of the risk drivers for the Site. The standard deviation, alpha and beta error rates, width of the gray region, and a threshold value (screening value) can then be used in Phase II as input into Visual Sample Plan software algorithms to statistically determine the minimum number of samples required to meet the Data Quality Objectives for the Site. Appendix A (Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical) is an example of a probabilistic sampling design, prepared from Visual Sample Plan software, that could be applied in Phase II of the RI/FS for the Site. Another scoping meeting will be held to evaluate the data gathered during Phase I and to determine the actions required for Phase II.

For human health and ecological risk assessment screening purposes, any chemicals detected at the Site above their respective screening levels will be carried forward in the risk assessments required by the NCP, taking into account synergistic effects. For ecological risk assessment screening purposes, bioaccumulative chemicals may need to be carried forward in the risk assessment if found below their respective screening levels. For both the human health and ecological risk assessments, the maximum detected concentrations shall be used for risk screening purposes. The statistically derived 95 percent upper confidence limit (UCL) of the arithmetic mean (if the sample size is adequate) or maximum concentration (if the sample size is inadequate), whichever is appropriate for a given medium, will be calculated for use as the concentration term in the risk assessment equations following the risk screening process. The statistical methods described in the EPA's guidance documents for calculating UCLs are based on the assumption of random sampling.

91. Section A5.1 - Problem Definition (Pages 16 and 17, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Off-Site Phase I Sampling:
>
> . . . . . .
>
> - Obtain five judgmental sediment samples and five subsurface sediment samples from locations adjacent to the underground pipelines and two former pipeline spill locations in the wetlands;
>
> . . . . . .

- Obtain representative background samples for sediment and soil."

EPA's Comments

Figure 23, of the Draft Final QAPP, shall be revised to show the additional judgmental sampling locations depicted on Appendix C (Additional and Revised Judgmental Sampling Locations) of the EPA's comments. The purpose of these sampling locations is to characterize the known historic and recent pipeline spills/cuts and specific surface water, soil, and sediment locations.

For clarification purposes, background samples should be collected concurrently with the other samples in order to provide an appropriate comparison with which to characterize the nature and extent of potential contamination of the Site. These background samples should be taken at appropriate reference locations, specific to each medium to be sampled, and should be abundant enough to provide adequate reference points. This is particularly important for sediment samples, which are inherently variable due to the physico-chemical properties of aquatic systems.

The procedures for determining background concentrations are described in the EPA's guidance documents entitled "Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites" (Office of Solid Waste and Emergency Response, EPA/540/5-96/500, December 1995) and "Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites" (EPA 540-R-01-003, 2002). NORCO shall continue discussions with the EPA concerning the number and locations of background for the Site. Discussion topics shall include comparability of soil/sediment types, comparability of physical and geochemical characteristics, land use history, and predominant wind direction relative to the Site.

92. Section A5.1 - Problem Definition (Page 17, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

"Phase II Investigation (if warranted):"

EPA's Comments

The Draft Final QAPP shall be revised to include a detailed discussion of Phases I and II of the Remedial Investigation and Feasibility Study for the Site. Since little information exists on the distribution of chemical risk drivers at the Site, the sampling strategy will have to be carried out in at least two phases. Some prior knowledge of chemical distributions is required

before performing statistical calculations to be used in the determination of the minimum number of samples required to meet the objectives of the Remedial Investigation and Feasibility Study for the Site. The EPA does not desire to abandon a contaminated site nor clean up a clean site, and a well developed field sampling plan will limit the possibilities of making these decision errors.

For Phase I, the number of soil, sediment, ground water, and surface water judgmental or random-grid sampling locations was initially determined by the Site Team and is not based on the distribution of the risk drivers, if any, for the Site. Ideally, Phase I would determine the distribution of the risk drivers for the Site. The standard deviation, alpha and beta error rates, width of the gray region, and a threshold value (screening value) can then be used in Phase II as input into Visual Sample Plan software algorithms to statistically determine the minimum number of samples required to meet the Data Quality Objectives for the Site. Appendix A (Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical) is an example of a probabilistic sampling design, prepared from Visual Sample Plan software, that could be applied in Phase II of the RI/FS for the Site. Another scoping meeting will be held to evaluate the data gathered during Phase I and to determine the actions required for Phase II.

For human health and ecological risk assessment screening purposes, any chemicals detected at the Site above their respective screening levels will be carried forward in the risk assessments required by the NCP, taking into account synergistic effects. For ecological risk assessment screening purposes, bioaccumulative chemicals may need to be carried forward in the risk assessment if found below their respective screening levels. For both the human health and ecological risk assessments, the maximum detected concentrations shall be used for risk screening purposes. The statistically derived 95 percent upper confidence limit (UCL) of the arithmetic mean (if the sample size is adequate) or maximum concentration (if the sample size is inadequate), whichever is appropriate for a given medium, will be calculated for use as the concentration term in the risk assessment equations following the risk screening process. The statistical methods described in the EPA's guidance documents for calculating UCLs are based on the assumption of random sampling.

93. Section A5.2 - Background (Page 17, 2nd and 3rd Paragraphs)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP identifies Figures 2 (Area Map) and 3 (Site Map).

EPA's Comments

Figure 2 of the Draft Final QAPP shall be revised to depict "FM 361," "FM 2725," and "Bishop Road." Figure 3 of the Second Amended Draft QAPP does not reflect the correct locations for the historic barge dock nor the pipelines leading to this barge dock. Figure 3, of the Draft Final QAPP, shall be replaced with the pipeline map recently provided to the EPA's On-

Scene Coordinator for the ongoing removal action. Additionally, this map, or another map, shall identify the ownership of the pipelines which shall include NORCO's pipelines leading to the current and historic barge docks.

94. Section A5.2 - Background (Page 21, 19th Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "On July 22, 1992, the Texas Natural Resources Conservation Commission . . . issued a letter to Mr. Dickey Henderson . . . ."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "On July 29, 2002, the Texas Natural Resources Conservation Commission . . . issued a letter to Mr. Dickey Henderson . . . ."

95. Section A6 - Description of Project and Tasks (Page 22; 1st, 2nd, and 5th Paragraphs)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP identifies Figure 4 (Human Health and Ecological Risk Assessment Conceptual Site Model), which consists of a flow diagram, Figure 5 (AOC Map), and Table 2 (Screening and Analytical Methods). Figure 4 states that:

> "• = Pathway identified for elevation in the human health risk assessment.
>
> o = Identified as a low potential for exposure. Pathway not identified for evaluation in the human health risk assessment."

EPA's Comments

The Draft Final QAPP shall be revised to include, in addition to the flow diagrams, the conceptual site models in schematic format which is easily understood by the public. Appendix B (Example Schematic Ecological Conceptual Site Model) provides an example of a schematic of an ecological conceptual site model that could be appropriate for this Site and would be easily understood by the public. The schematic of the ecological conceptual site model included in the Second Amended Draft QAPP does not adequately depict the exposure pathways and receptors. The Draft Final FSP shall include a similar schematic for the human health conceptual site model.

Additionally, the trespasser scenario shall consider someone who trespasses on-site and uses the wetlands for fishing since they may consume fish from the wetland areas. The trespasser scenario shall also include off-site sediment and surface water in the wetland area since a trespasser is likely to wander into both on- and off-site areas. The conceptual site model shall also be revised to depict leaks and spills as a primary release mechanism to the on- and off-site wetlands and to depict the fish ingesting fish/shellfish pathway for releases from the dock facilities into marine/coastal waters. The conceptual site model shall also consider that mammals, birds, and reptiles could be indirectly exposed to site COPECs due to the ingestion of soil and sediment invertebrates and plants. It appears that Figure 4 currently only reflects the direct exposure pathways.

Figure 5, of the Second Amended Draft QAPP, does not reflect the correct locations for the historic barge dock nor the pipelines leading to this barge dock. Figure 5, of the Draft Final QAPP, shall be replaced with the pipeline map recently provided to the EPA's On-Scene Coordinator for the ongoing removal action. Additionally, this map, or another map, shall identify the ownership of the pipelines which shall include NORCO's pipelines leading to the current and historic barge docks.

Figure 4, of the Draft Final QAPP, shall be revised to state that:

> "• = Pathway identified for evaluation in the human health and ecological risk assessments.
>
> o = Identified as a low potential for exposure. Pathway not identified for evaluation in the human health risk and ecological risk assessments."

Table 2, of the Draft Final QAPP, shall be revised to identify the analytical methods that will be used for sediments.

96. Section A6 - Description of Project and Tasks (Page 22, 3rd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Objectives of the project include:
>
> . . . . . .
>
> - Identify source areas that may continue to contaminate the site;"

EPA's Comments

The EPA has reviewed NORCO's document entitled "Draft Removal Action Work Plan Addendum 1A" (December 15, 2006), which was submitted to the EPA's On-Scene Coordinator for the ongoing Removal Action. Page 5 of the addendum states that:

> "Pipeline pigging continued on the pipelines that were 8-inch or larger from Bishop Road to Sunray Road. The remainder of the contents of the pipelines was evacuated using a vacuum truck. The vacuum truck pulled fluids initially from the pipeline segments from Bishop Road to Sunray Road and then from Sunray Road to the former docking facility. The contents of all 10 pipelines were removed."

The EPA does not believe that the pipelines from Sunray Road to the historic barge dock facility were properly evacuated and could act as a continuing source of contamination to the soils and sediments in this area. Evacuation of these lines would have depended only on gravity flow since NORCO did not have access to the end of the lines near the historic barge dock facility. The Draft Final QAPP, or as appropriate the Draft Final WP or FSP, shall include an expedited schedule to further address these pipelines before any sampling occurs in these areas.

97. Section A6 - Description of Project and Tasks (Page 22, 4th Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "When the FSP is approved, an updated schedule will be developed and placed on form Table D-2, Project Schedule Time Line from EPA document QA/G-5. The schedule will then be provided to the EPA."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "When the FSP is approved, an updated schedule will be developed and Appendix H (Project Schedule) of the Draft Final WP will be updated and included in the FSP and provided to the EPA."

98. Section A6 - Description of Project and Tasks (Page 22, 5th Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP identifies Table 2 (Screening and Analytical Methods).

EPA's Comments

Table 2, of the Second Amended Draft QAPP, does not specify screening and analytical methods for sediment samples. Table 2, of the Draft Final QAPP, shall be revised to specify screening and analytical methods for sediment samples.

99. Section A7.2.1.1 - Identify Members of the Planning Team (Page 24, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "The EPA's RPM . . . for RI/FS activities conducted under the Agreed Order on Consent."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "The EPA's RPM . . . for RI/FS activities conducted under the Administrative Order on Consent."

100. Section A7.2.1.2 - Develop the Conceptual Site Model (Page 25, 3rd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "In general, the planning team will:
>
> . . . . . .
>
> - Determine the Applicable or Relevant and Appropriate Requirements (ARARs) for the site; . . . ."

EPA's Comments

The Draft Final QAPP shall be revised to include a discussion and preliminary list of the probable "Applicable or Relevant and Appropriate Requirements" (ARARs) for the Site. This list shall be compiled according to established EPA guidance, research of existing regulations, and collection of site-specific information and data. Chemical- and location-specific ARARs are identified early in the process, generally during the site investigation, while action-specific ARARs are usually identified during the Feasibility Study in the detailed analysis of alternatives.

101. Section A7.2.2.1 - Identify the Principal Study Question (Pages 25 and 26, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

"The principal study question (PSQ) for the Falcon Refinery RI is:

- Do levels of COPC exist either on or off the refinery property at concentrations above risk-based screening levels and/or background mean concentrations along complete exposure pathways for relevant exposure scenarios?

Additional study questions:

- Where do COPC concentrations exceed human and ecological risk-based screening levels?
- What are the potential migration and exposure pathways and do the data indicate a possibility of the COPC being released from the site?"

EPA's Comments

The Draft Final QAPP shall be revised to state that:

"The principal study question (PSQ) for the Falcon Refinery RI is:

- Do levels of COPCs exist either on or off the refinery property at concentrations above or below risk-based screening levels and/or background concentrations along complete exposure pathways for

relevant exposure scenarios and do the COPCs pose a risk to human health or the environment?

Additional study questions:

- Where are the COPC concentrations above or below human and ecological risk-based screening levels?
- What are the potential migration and exposure pathways and do the data indicate a possibility of the COPC being released from the site?
- What is the distribution of COPCs (risk drivers) at the Site, which will be used for the appropriate statistical parameters and in the determination of the minimum number of samples required for Phase II of the Remedial Investigation and Feasibility Study for the Site?"

For clarification purposes, the EPA's background policy does not allow for the elimination of COPCs based on a background comparison. Background samples should be collected concurrently with the other samples in order to provide an appropriate comparison with which to characterize the nature and extent of potential contamination of the Site. These background samples should be taken at appropriate reference locations, specific to each medium to be sampled, and should be abundant enough to provide adequate reference points. This is particularly important for sediment samples, which are inherently variable due to the physico-chemical properties of aquatic systems.

The procedures for determining background concentrations are described in the EPA's guidance documents entitled "Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites" (Office of Solid Waste and Emergency Response, EPA/540/5-96/500, December 1995) and "Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites" (EPA 540-R-01-003, 2002). NORCO shall continue discussions with the EPA concerning the number and locations of background for the Site. Discussion topics shall include comparability of soil/sediment types, comparability of physical and geochemical characteristics, land use history, and predominant wind direction relative to the Site.

102. Section A7.2.2.4 - Decision Statement (DS) (Page 26, 1st and 2nd Paragraphs)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Decision Statement (DS) #1: Determine the nature and extent of any COPC on the refinery property at concentrations above risk-based screening levels and/or background mean concentrations along complete exposure pathways for relevant exposure scenarios, and if below risk-based screening levels, do the COPCs still pose a risk to human health or the environment and requires remedial action or no further action.
>
> DS #2: Determine the nature and extent of any COPC in the wetlands, bay or neighborhoods adjacent to the refinery at concentrations above risk-based screening levels and/or background mean concentrations along complete exposure pathways for relevant exposure scenarios and requires remedial action or no further action."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "Decision Statement (DS) #1: Determine the nature and extent of any COPC on the refinery property at concentrations above or below risk-based screening levels and/or background concentrations along complete exposure pathways for relevant exposure scenarios and requires remedial action or no further action.
>
> DS #2: Determine the nature and extent of any COPC in the wetlands, bay or neighborhoods adjacent to the refinery at concentrations above or below risk-based screening levels and/or background concentrations along complete exposure pathways for relevant exposure scenarios and requires remedial action or no further action."

For clarification purposes, the EPA's background policy does not allow for the elimination of COPCs based on a background comparison. Background samples should be collected concurrently with the other samples in order to provide an appropriate comparison with which to characterize the nature and extent of potential contamination of the Site. These background samples should be taken at appropriate reference locations, specific to each medium to be sampled, and should be abundant enough to provide adequate reference points. This is particularly important for sediment samples, which are inherently variable due to the physico-chemical properties of aquatic systems.

The procedures for determining background concentrations are described in the EPA's guidance documents entitled "Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites" (Office of Solid Waste and Emergency Response, EPA/540/5-96/500, December 1995) and "Guidance for Comparing Background and

Chemical Concentrations in Soil for CERCLA Sites" (EPA 540-R-01-003, 2002). NORCO shall continue discussions with the EPA concerning the number and locations of background for the Site. Discussion topics shall include comparability of soil/sediment types, comparability of physical and geochemical characteristics, land use history, and predominant wind direction relative to the Site.

103. Section A7.2.4.4 - Define the Scale of Decision-Making (Page 29, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Decisions during the RI will be made based on the following area scales:
>
> - On-site OU investigation - where . . . based on judgmental sampling.
>
> . . . . . .
>
> - Off-site surface water sampling - where . . . based on judgmental sampling and site conditions."

EPA's Comments

For clarification purposes, decision-making for risk assessment purposes should be based on how each area is utilized by the receptor and may not be consistent with the spatial definition of each "Area of Concern" as defined in the RI/FS deliverables.

104. Section A7.2.3 - Step 3 - Identify Inputs to the Decision (Page 27, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "The action level - such as a soil screening level (SSL), or a PRG, is another important input that will be considered during this step."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "The action level; such as a soil screening level (SSL), PRG, or ARAR; is another important input that will be considered during this step."

105. Section A7.2.3.1 - Step 3 - Identify the Information Required to Resolve the Decision Statement (Page 27, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Concentrations will be compared to appropriate screening levels and background samples."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "Concentrations will be compared to appropriate screening levels and background samples and the appropriate risk assessments, required by the NCP, will be performed."

106. Section A7.2.3.2 - Determine the Sources for Information Identified (Page 27, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "The following existing sources will be utilized:
>
> . . . . . .
>
> - Integrated Risk Information System (IRIS) and Health Effects Assessment Summary Tables (HEAST);"

EPA's Comments

The Draft Final QAPP shall be revised to identify the following recommended hierarchy for human health toxicity data and shall state that:

> "A recent EPA directive entitled 'Human Health Toxicity Values in Superfund Risk Assessments' (OSWER Directive 9285.7-53; December 5, 2003) revises the recommended hierarchy of human health toxicity values originally presented in the EPA's guidance document entitled 'Risk Assessment Guidance for Superfund' (Volume I; Part A; Human Health Evaluation Manual; OSWER 9285.7-02B, EPA/540/1-89/002, December 1989).

The Integrated Risk Information System (IRIS) remains in the first tier (Tier I) of the recommended hierarchy as the generally preferred source of human health toxicity values. IRIS generally contains reference doses (RfDs), reference concentrations (RfCs), cancer slope factors, drinking water unit risk values, and inhalation unit risk values that have gone through a peer review and the EPA's consensus review process. IRIS normally represents the official Agency scientific position regarding the toxicity of the chemicals based on the data available at the time of the review.

The second tier (Tier II) is the EPA's Provisional Peer Reviewed Toxicity Values (PPRTVs), which are available by request to EPA Region 6. Generally, PPRTVs are derived for one of two reasons. First, the Superfund Health Risk Technical Support Center (STSC) is conducting a batch-wise review of the toxicity values in the Health and Environmental Affects Summary Tables (HEAST), now a Tier 3 source. As such reviews are completed, those toxicity values will be removed from HEAST, and any new toxicity value developed in such a review will be a PPRTV and placed in the PPRTV database. Second, Regional Superfund offices may request a PPRTV for contaminants lacking a relevant IRIS value. The STSC uses the same methodologies to derive PPRTVs for both.

The third tier (Tier III) includes other sources of information. Priority should be given to sources that provide toxicity information based on similar methods and procedures as those used for Tier I and Tier II, contain values which are peer reviewed, are available to the public, and are transparent about the methods and processes used to develop the values. Consultation with the STSC or headquarter's program office is recommended regarding the use of the Tier 3 values for Superfund response decisions when the contaminant appears to be a risk driver for the site. In general, draft toxicity assessments are not appropriate for use until they have been through peer review, the peer review comments have been addressed in a revised draft, and the revised draft is publicly available.

Additional sources may be identified for Tier III. Toxicity values that fall within the third tier in the hierarchy include, but need not be limited to, the following sources:

- The California Environmental Protection Agency toxicity values are peer reviewed and address both cancer and non-cancer effects.
- The Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs) are estimates of the daily human exposure to a hazardous substance that is likely to be without

appreciable risk of adverse non-cancer health effects over a specified duration of exposure. The ATSDR MRLs are peer reviewed.

- HEAST toxicity values are Tier 3 values. As noted above, the STSC is conducting a batch-wise review of HEAST toxicity values. The toxicity values remaining in HEAST are considered Tier 3 values."

107. Section A7.2.3.3 - Identify the Information Needed to Establish the Action Level (Page 28, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "For non-carcinogenic effects the hazard index should not be greater that 1."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "For non-carcinogenic effects the hazard index should not be greater than 1. For carcinogenic effects carcinogens will be evaluated at a risk range of 1.0×10^{-4} to 1.0×10^{-6}."

108. Section A7.2.3.4 - Confirm Appropriate Analytical Method (Page 28, 1st and 2nd Paragraphs)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP identifies Table 2 (Screening and Analytical Methods) and states that:

> "Contract Laboratory Program (CLP) procedures ILM05.3 will be used for inorganic constituents and SOM01.1 will be used for organic constituents."

EPA's Comments

Table 2, of the Draft Final QAPP, including the text, shall be revised to exclude references to CLP SOM01.1. and CLP ILM05.3. These references refer to analytical services provided by the EPA's Contract Laboratory Program (CLP) to CLP customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies). These

analytical services are not accessible to Potentially Responsible Parties. Additionally, Table 2 shall be revised to include the specific analytical method that will be used for the analyses of soil/sediment and aqueous samples.

109. Section A7.2.5.1 - Specify the Statistical Parameters that Characterizes the Population (Pages 30 and 31; 1st, 4th, and 6th Paragraphs)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "In addition to the screening levels, National Primary Drinking Water Standards will be utilized.
>
> . . . . . .
>
> . . . on-site concentrations will also be compared to the chemical-specific ARAR listed below.
>
> - National Primary Drinking Water Standards
>
> . . . . . .
>
> In subsequent phases, the parameter to characterize each population (medium) may include the 90 or 95-percent upper confidence level for a given exposure area."

EPA's Comments

The Draft Final QAPP shall be revised to include additional "Applicable or Relevant and Appropriate Requirements," such as State and Federal ambient water quality criteria (among others) for the protection of human health and ecological receptors, that may be applicable to the Site. Additionally, the Draft Final QAPP shall be revised to state that:

> "In subsequent phases, if the sample size is adequate, the parameter to characterize each population (medium) will include the 95-percent upper confidence level for a given exposure area. If the sample size is inadequate, then the maximum concentration should be used as the parameter to characterize each population (medium). For Superfund risk assessments, required by the NCP, the concentration term in the intake equation is an estimate of the arithmetic average concentration for a contaminant based on a set of site sampling results. Because of the uncertainty associated with estimating the true average concentration at a site, the statistically-derived 95 percent upper confidence limit (UCL) of the

arithmetic mean should be used for this variable. The 95 percent UCL provides reasonable confidence that the true site average will not be underestimated.

The EPA's UCL exposure point concentration guidance document entitled 'Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites' (OSWER 9285.6-10, December 2002) updates the May 1992 UCL guidance and provides alternative methods for calculating the 95% UCL. The statistical methods described in this guidance for calculating UCLs are based on the assumption of random sampling."

110. Section A7.2.5.3 - Confirm that the Risk-Based Screening Level Exceeds Measurement Detection Limits (Page 32, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP identifies Appendix B (Comparison of CLP CRQLs to Ecological Screening Standards and EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs).

EPA's Comments

The Draft Final QAPP shall be revised to reflect Appendix B (Comparison of Quantitation Limits to Ecological Screening Standards). Additionally, the "Comparison of CLP CRQLs to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs" shall be included in a separate appendix, for easy reference, and entitled "Comparison of Quantitation Limits to EPA Region 6 Human Health MSSLs and TCEQ Tier 1 PCLs." The EPA's Region 6 MSSLs, TCEQ's Tier 1 PCLs, and TCEQ's ecological screening levels have been updated. The Draft Final QAPP (including the Draft Final WP and FSP) shall be revised to include an updated Appendix B. The sources listed in Appendix B shall be revised to reflect the sources discussed in the text of the Draft Final QAPP.

For clarification purposes, the chemicals included in Appendix B, of the Second Amended Draft QAPP, are derived from the EPA's Contract Laboratory Program (CLP). The CLP is a national network of EPA personnel, commercial laboratories, and support contractors whose fundamental mission is to provide customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies) with analytical data of known and documented quality. The CLP provides its customers with services such as environmental sample analyses. These analytical services are designated as "CLP SOM01.1" for organics and "CLP ILM05.3" for inorganics. The "target compound list" for organics and the "target analyte list" for inorganics, included in Appendix B of the Second Amended Draft QAPP, do not include all of the chemicals that may be of potential concern at the Site (e.g., vinyl acetate, among others). Additionally, the analytical services provided by the CLP are not accessible to Potentially Responsible Parties.

Appendix B, of the Draft Final QAPP, shall be revised to include all of the chemicals that may be of potential concern at the Site. These chemicals include, but are not limited to, total polycyclic aromatic hydrocarbons (including the PAHs listed in the TCEQ's 2001 guidance), hexavalent chromium, vinyl acetate, those chemicals analyzed for the HRS Documentation Record, and those chemicals that are associated with refinery processes.

The chemicals listed in the table of Appendix B, of the Second Amended Draft QAPP, need to be rearranged in the Draft Final QAPP, including the new appendix for the human health screening criteria, for easy reference. The chemicals should be arranged alphabetically by chemical type (e.g., organics [VOCs and SVOCs] and inorganics, etc.).

Appendix B, or the text of the Draft Final QAPP, shall identify which risk values will be used in the risk screening process and the appendix shall be modified to reduce the number of significant digits. Additionally, maximum contaminant levels (MCLs) shall be provided in the screening table when available for a particular chemical.

The surface water ecological benchmarks of Appendix B, of the Second Amended Draft QAPP, are benchmarks for fresh water. Appendix B, of the Draft Final QAPP, shall be revised to include benchmarks for salt water since both fresh water and salt water exist at the Site. Additionally, Appendix B and/or the text of the Draft Final QAPP shall provide an explanation of how brackish water will be classified.

Appendix B, of the Draft Final QAPP, shall be revised to include benchmark values for marine and freshwater sediments since both are present at the Site. Additionally, Appendix B shall be revised to depict soil and sediment benchmarks separately. Soil and sediment benchmarks should not be combined.

"Footnote 3" of Appendix B, of the Second Amended Draft QAPP, states that ecological benchmarks provided below are described in Table 5-5. The Second Amended Draft QAPP does not include Table 5-5. The text of Footnote 3 should be deleted from the Draft Final QAPP or revised to reflect the appropriate reference.

Appendix B, of the Second Amended Draft QAPP, lists the source for several of the benchmarks as the Region 6 Ecological Screening Benchmark Tables. The EPA Region 6 Ecological Screening Benchmark Tables shall not be used for this RI/FS. These benchmarks have not been peer reviewed and are outdated. The primary source of ecological benchmark values will be the TCEQ 2006 ecological screening benchmarks. If a COPC is not listed in the TCEQ ecological screening benchmark tables, then a search for additional sources of benchmark values will be conducted, and the source of the benchmark values will be documented so that details of how the benchmark values were developed can be verified. If a benchmark is not proposed, then the COPC will be retained and evaluated further during the baseline ecological risk assessment. The Draft Final QAPP (including the WP and FSP) shall be revised accordingly.

Appendix B, of the Draft Final QAPP, shall list primary literature searches, for benchmark values other than TCEQ ecological benchmarks (since these are already referenced), so that details on how the benchmark values were developed can be researched and verified.

The text of the Draft Final QAPP shall discuss how chemicals will be treated if their respective quantitation limit is greater than the appropriate benchmark.

111. Section A7.2.5.3 - Confirm that the Risk-Based Screening Level Exceeds Measurement Detection Limits (Page 32, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP identifies Tables 4 (Quantitation Limits for Aqueous Samples) and 5 (Quantitation Limits for Soil Samples) and states that:

> "Quantitation limits with risk-based screening values near or below the CLP quantitation limits are provided in Tables 4 and 5."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "Risk-based screening values near or below the quantitation limits are provided in Tables 4 and 5."

Tables 4 and 5, of the Draft Final QAPP, shall be revised to exclude references to CLP SOM01.1. and CLP ILM05.3. These references refer to analytical services provided by the EPA's Contract Laboratory Program (CLP) to CLP customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies). These analytical services are not accessible to Potentially Responsible Parties. Additionally, Table 4 shall be revised to include the specific analytical method that will be used for the analyses of aqueous samples. Table 5 shall be revised to include the specific analytical method that will be used for the analyses of soil/sediment samples.

Tables 4 and 5, of the Draft Final QAPP, shall be revised to include a complete listing of those chemicals with water and soil/sediment screening levels near or below the quantitation limits. Additionally, Tables 4 and 5 shall reflect those chemicals included in the updated versions, based on the EPA's comments, of Appendices B, G, and E, of the Draft Final QAPP, WP, FSP, respectively. Also, the text of each of these deliverables shall discuss how chemicals will be treated if the their quantitation limit is greater than the respective benchmark.

The references in Tables 4 and 5, of the Second Amended Draft QAPP, include outdated references for the EPA's MSSLs and TCEQ's screening ecological benchmarks. The Draft Final QAPP, including Tables 4 and 5, shall be revised to include the updated screening values and references.

112. Section A7.2.5.3 - Confirm that the Risk-Based Screening Level Exceeds Measurement Detection Limits (Page 32, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "A preliminary analysis of analytical method requirements has been conducted. Contract required quantitation limits (CRQLs) associated with EPA's contract laboratory program (CLP) have been compared to human health and ecological benchmark values. CRQLs are the minimum levels of quantitation acceptable under the CLP contract statement of work (SOW). CRQLs for inorganics were identified from the EPA CLP CLP-SOW for Inorganic Analysis ILM05.3 (EPA,2004). CRQLs for organics, including VOCs, SVOCs, pesticides, and PCBs, were identified from the CLP-SOW for Organic Analysis SOM01.1 (EPA, 2006)."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "A preliminary analysis of analytical method requirements has been conducted. Quantitation limits associated with each analytical method have been compared to human health and ecological benchmark values."

The Draft Final QAPP shall be revised to exclude references to CLP SOM01.1., CLP ILM05.3., and "contract required quantitation limits." These references refer to analytical services provided by the EPA's Contract Laboratory Program (CLP) to CLP customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies). These analytical services are not accessible to Potentially Responsible Parties.

113. Section A7.2.5.3 - Confirm that the Risk-Based Screening Level Exceeds Measurement Detection Limits (Page 32, 3rd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> ". . . EPA Region 6 MSSLs . . . (as published on December 21, 2004) were compared . . . .
>
> . . . . . .
>
> EPA's MSSLs (revised 12/21/04) are based on achieving . . . ."

EPA's Comments

The EPA's Region 6 MSSLs have been revised. The Draft Final QAPP (including the Draft Final WP and FSP) shall be revised to include an updated Appendix B.

114. Section A7.2.5.3 - Confirm that the Risk-Based Screening Level Exceeds Measurement Detection Limits (Page 32, 4th Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "COPC detection limits that exceeded the carcinogenic screening value (10-6 cancer risk) will be compared to the 10-5 to 10-4 cancer risk range and discussed with EPA Region 6 risk assessors and described in the Uncertainty Analysis section of the HHRA and ERA."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "For COPCs where the detection limits exceed the carcinogenic or non-carcinogenic screening values (1.0×10^{-6} cancer risk or Hazard Quotient of 1, respectively), the measured concentration will be reported as ½ of the detection limit and compared to the carcinogenic or non-carcinogenic screening values, as appropriate, and carried forward into the risk assessments. Discussions will be held with the EPA's risk assessors concerning these situations. These circumstances may also be described in the uncertainty analysis section of the HHRA and ERA."

115. Section A7.2.5.4 - Combine the Outputs and Develop the Decision Rule (Page 32, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP briefly discusses the decision rules for Phase I of the Remedial Investigation and Feasibility Study for the Site.

EPA's Comments

The Draft Final QAPP shall be revised to include a detailed discussion of the "Decision Rules" for Phases I and II of the Remedial Investigation and Feasibility Study for the Site. Since little information exists on the distribution of chemical risk drivers at the Site, the sampling strategy will have to be carried out in at least two phases. Some prior knowledge of chemical distributions is required before performing statistical calculations to be used in the determination of the minimum number of samples required to meet the objectives of the Remedial Investigation and Feasibility Study for the Site. The EPA does not desire to abandon a contaminated site nor clean up a clean site, and a well developed field sampling plan will limit the possibilities of making these decision errors.

For Phase I, the number of soil, sediment, ground water, and surface water judgmental or random-grid sampling locations was initially determined by the Site Team and is not based on the distribution of the risk drivers, if any, for the Site. Ideally, Phase I would determine the distribution of the risk drivers for the Site. The standard deviation, alpha and beta error rates, width of the gray region, and a threshold value (screening value) can then be used in Phase II as input into Visual Sample Plan software algorithms to statistically determine the minimum number of samples required to meet the Data Quality Objectives for the Site. Appendix A (Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical) is an example of a probabilistic sampling design, prepared from Visual Sample Plan software, that could be applied in Phase II of the RI/FS for the Site. Another scoping meeting will be held to evaluate the data gathered during Phase I and to determine the actions required for Phase II.

For human health and ecological risk assessment screening purposes, any chemicals detected at the Site above their respective screening levels will be carried forward in the risk assessments required by the NCP, taking into account synergistic effects. For ecological risk assessment screening purposes, bioaccumulative chemicals may need to be carried forward in the risk assessment if found below their respective screening levels. For both the human health and ecological risk assessments, the maximum detected concentrations shall be used for risk screening purposes. The statistically derived 95 percent upper confidence limit (UCL) of the arithmetic mean (if the sample size is adequate) or maximum concentration (if the sample size is inadequate), whichever is appropriate for a given medium, will be calculated for use as the

concentration term in the risk assessment equations following the risk screening process. The statistical methods described in the EPA's guidance documents for calculating UCLs are based on the assumption of random sampling.

116. Section A7.2.6.3 - Specify a Gray Region (Page 35, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "For this site, the gray region will be represented on the lower boundary by 80% of the screening level (Region 6 MSSLs and TCEQ ecological benchmarks) and on the upper boundary by the screening level. Decisions to remediate any portion of the site will be based on the HHRA and the ERA and not the exceedance of screening levels."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "For this Site, the width of the gray region will be discussed during Phase II of the RI/FS. The gray region will be represented on the lower boundary by a value chosen by the Site Team and on the upper boundary by the appropriate screening level. Decisions to remediate any portion of the Site will be based on the HHRA and the ERA, required by the NCP, and not on the exceedance of screening levels."

117. Section A7.2.6.4 - Assign Probability Values to Points Above and Below the Risk-Based Screening Level (Page 36, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Based on the selected tolerable limits, the VSP program was used to evaluate the feasibility of the selected limits on error. As a baseline for determining the limits on error, concentrations of COPC both on site and in the residential area west of the site obtained from historical samples were used. In the assessment of the sample number, using the VSP program, the EPA Region 6 residential MSSLs for COPCs were used as the screening limit."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "Based on the selected tolerable limits, the VSP program will be used to evaluate the feasibility of the selected limits on error. As a baseline for determining the limits on error, concentrations of COPCs both on- and off-site will be obtained from historical and Phase I sampling results. In the assessment of the sample number, using the VSP program, the appropriate screening levels will be used as the screening limit."

118. Section A7.2.7.1 - Review Existing Environmental Data (Page 36, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Outputs from the previous DQO steps were reviewed to develop the data collection design in the following ways:
>
> - Inputs, boundaries, and decision rules were used to determine the type, location, and timing of samples;
> - Limits on decision errors provided information for selecting the number of samples to be collected and the number of analyses per sample."

EPA's Comments

The Draft Final QAPP shall be revised to stat that:

> "Outputs from the previous DQO steps will be reviewed to develop the data collection design in the following ways:
>
> - Inputs, boundaries, and decision rules will be used to determine the type, location, number, and timing of samples;
> - Limits on decision errors will provide information for selecting the number of samples to be collected and the number of analyses per sample."

119. Section A7.2.7.2 - Develop General Data Collection Design Alternatives (Page 37, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Existing analytical data indicates that a small sample population from the background data exceeded human health and ecological screening levels of the samples that met the CRQL. However, records are available that described spills and releases at the site and visual contamination is evident."

EPA's Comments

The Draft Final QAPP shall be revised to delete the first sentence of this paragraph and to state that:

> "Records are available that describe spills and releases at the Site and visual contamination is evident."

The examination of any existing analytical data, from the Hazard Ranking System Documentation Record, and comparisons to background and/or screening levels may be performed after the data are collected for this RI/FS.

120. Section A7.2.7.3 - Select the Sample Size that Satisfies the DQO (Page 37, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "As a result, the number of samples to be obtained in each AOC was determined by the planning team. After the data from the Phase I RI are reviewed an analysis will be made in VSP to determine if an adequate number of samples exist and the DQO process will be reexamined. Described in this section will be the number of samples for each AOC."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "As a result, the number of samples to be obtained in each AOC was determined by the Site Team. After the data from the Phase I RI are reviewed, an analysis will be made in VSP to determine if an adequate number of samples exist and the DQO process will be reexamined. Described in this section are the number of samples for each AOC, determined by the Site Team for Phase I."

Additionally, these statements need to be reflected throughout the Draft Final WP and FSP for clarification purposes concerning the purpose of Phases I and II of the Remedial Investigation and Feasibility Study for the Site.

121. Section A7.2.7.3 - Select the Sample Size that Satisfies the DQO - AOC 3 (Page 39, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "Samples will be obtained from the sediment in the 0.0 to 0.5 foot interval and will be analyzed . . . ."

EPA's Comments

The Draft Final QAPP shall be revised to state that:

> "Samples will be obtained from the sediment, or soil if sediments are not present, in the 0.0 to 0.5 foot interval and will be analyzed . . . ."

122. Section B2 - Sampling Methods (Page 47, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP identifies Table 7 (Required Sample Volume, Containers, Preservatives and Holding Times).

EPA's Comments

Table 7, of the Draft Final QAPP, shall be revised to exclude references to CLP SOM01.1. and CLP ILM05.3. These references refer to analytical services provided by the EPA's Contract Laboratory Program (CLP) to CLP customers (e.g., EPA Regions, U.S. Army Corps of Engineers, and other Federal, State, or Tribal Agencies). These analytical services are not accessible to Potentially Responsible Parties. Additionally, Table 7 shall be revised to include the specific analytical method that will be used for the analyses of soil/sediment and aqueous samples.

123. Section D2 - Validation and Verification Methods (Page 71, 1st Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> "All data that are used to support activities under the EPA Region 6 RAC program must be valid for their intended purposes."

EPA's Comments

The Draft Final QAPP shall be revised to exclude this statement. The RI/FS for this Site is not being funded or conducted under the EPA's Region 6 Response Action Contract (RAC) program.

124. Section D2.2 - Data Validation Procedures (Page 71, 2nd Paragraph)

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP states that:

> ". . . reporting requirements that are defined in Section A10, and data deliverables that requested from the laboratory, as discussed in Section A10."

EPA's Comments

The Second Amended Draft QAPP does not include "Section A10." The Draft Final QAPP shall be revised to include the appropriate section in the text of the QAPP.

125. References

Second Amended Draft Quality Assurance Project Plan

The Second Amended Draft QAPP does not include a "references" section.

EPA's Comments

The Draft Final QAPP shall be revised to include a "references" section. Additionally, the references in the text and in the references section of the Draft Final QAPP (including the WP and FSP) shall be reviewed for consistency and revised in the draft final deliverables. Any references not included in the text of the draft final deliverable shall be excluded from the references section of the respective deliverable. The Draft Final QAPP (including the WP and FSP) shall accurately reflect all references throughout their entirety.

APPENDICES

Appendix A

Example Visual Sample Plan Probabilistic Sampling Design for "X" Chemical

APPENDIX A
EXAMPLE VISUAL SAMPLE PLAN PROBABILISTIC SAMPLING DESIGN FOR "X" CHEMICAL

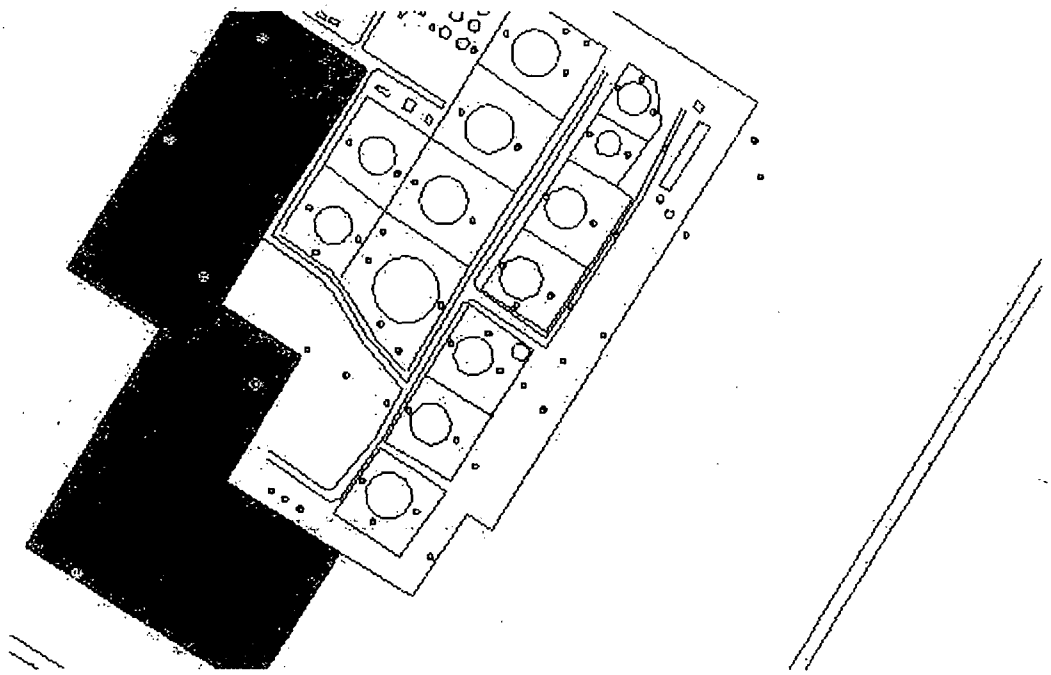
Random sampling locations for comparing a mean with a fixed threshold (nonparametric)

Summary
This report summarizes the sampling design used, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

The following table summarizes the sampling design developed. A figure that shows sampling locations in the field and a table that lists sampling location coordinates are also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Simple random sampling
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Wilcoxon signed ranks test
Calculated total number of samples	5
Number of samples on map [a]	5
Number of selected sample areas [b]	5
Specified sampling area [c]	728896.87 ft^2
Total cost of sampling [d]	$3500.00

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Area: Area 1					
X Coord	Y Coord	Label	Value	Type	Historical
3910366.5302	1809294.3283			Random	

Area: Area 2					
X Coord	Y Coord	Label	Value	Type	Historical

Area: Area 3					
X Coord	Y Coord	Label	Value	Type	Historical
3910618.0878	1810410.7031			Random	
3910699.7850	1810054.1105			Random	

Area: Area 4					
X Coord	Y Coord	Label	Value	Type	Historical
3910856.6891	1810669.6992			Random	

Area: Area 5					
X Coord	Y Coord	Label	Value	Type	Historical
3910830.6484	1809780.6592			Random	

Primary Sampling Objective

The primary purpose of sampling at this site is to compare a median or mean value with a fixed threshold. The working hypothesis (or 'null' hypothesis) is that the median(mean) value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the median(mean) value is less than the threshold. VSP calculates the number of samples required to reject the null hypothesis in favor of the alternative one, given a selected sampling approach and inputs to the associated equation.

Selected Sampling Approach
A nonparametric random sampling approach was used to determine the number of samples and to specify sampling locations. A nonparametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that typical parametric assumptions may not be true.

Both parametric and non-parametric equations rely on assumptions about the population. Typically, however, non-parametric equations require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than if a non-parametric equation was used.

Locating the sample points randomly provides data that are separated by many distances, whereas systematic samples are all equidistant apart. Therefore, random sampling provides more information about the spatial structure of the potential contamination than systematic sampling does. As with systematic sampling, random sampling also provides information regarding the mean value, but there is the possibility that areas of the site will not be represented with the same frequency as if uniform grid sampling were performed.

Number of Total Samples: Calculation Equation and Inputs
The equation used to calculate the number of samples is based on a Wilcoxon Signed Ranks test. For this site, the null hypothesis is rejected in favor of the alternative one if the sample median(mean) is sufficiently smaller than the threshold. The number of samples to collect is calculated so that if the inputs to the equation are true, the calculated number of samples will cause the null hypothesis to be rejected.

The formula used to calculate the number of samples is:

$$n = 1.16\left[\frac{\left(S^2_{sample} + \frac{S^2_{analytical}}{r}\right)}{\Delta^2}\left(Z_{1-\alpha} + Z_{1-\beta}\right)^2 + 0.5Z^2_{1-\alpha}\right]$$

where

n	is the number of samples,
S	is the estimated standard deviation of the measured values including analytical error,
D	is the width of the gray region,
a	is the acceptable probability of incorrectly concluding the site median(mean) is less than the threshold,
b	is the acceptable probability of incorrectly concluding the site median(mean) exceeds the threshold,
Z_{1-a}	is the value of the standard normal distribution such that the proportion of the distribution less than Z_{1-a} is 1-a,
Z_{1-b}	is the value of the standard normal distribution such that the proportion of the distribution less than Z_{1-b} is 1-b.

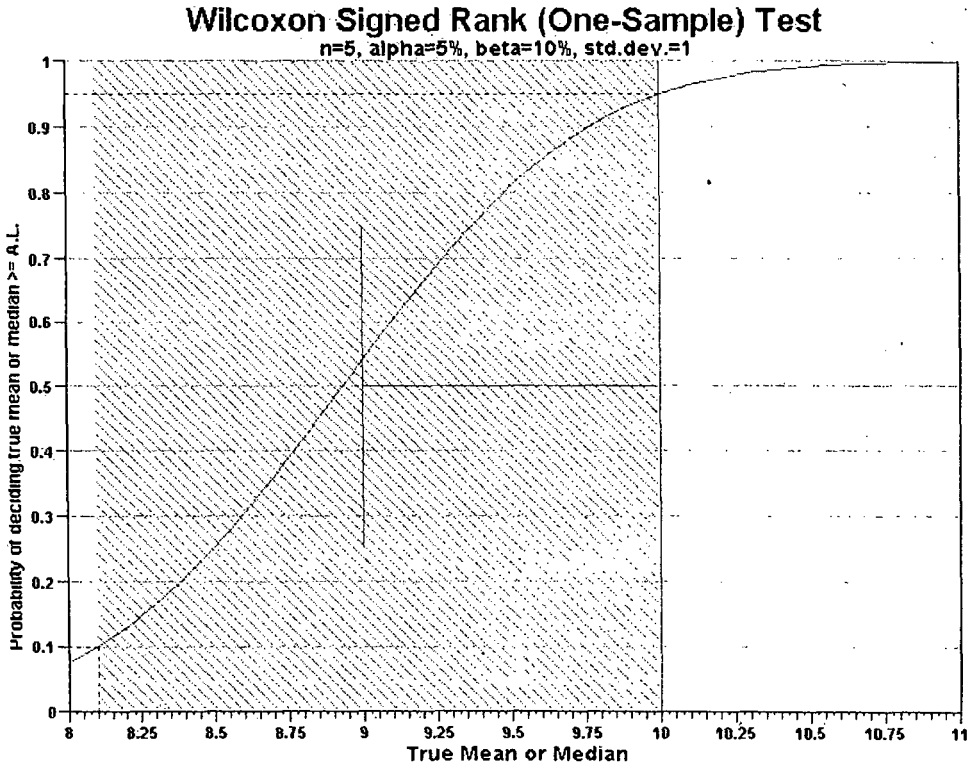
The values of these inputs that result in the calculated number of sampling locations are:

Parameter	Value
S	1
D	1.9
a	5%
b	10%
Z_{1-a}	1.64485 [a]
Z_{1-b}	1.28155 [b]

[a] This value is automatically calculated by VSP based upon the user defined value of a.
[b] This value is automatically calculated by VSP based upon the user defined value of b.

The following figure is a performance goal diagram, described in EPA's QA/G-4 guidance (EPA, 2000). It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true median(mean) values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The red vertical line is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to D; the upper horizontal dashed blue line is positioned at 1-a on the vertical axis; the lower horizontal dashed blue line is positioned at b on the vertical axis. The vertical green line is positioned at one standard deviation below the threshold. The shape of the red curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of D at b and the upper bound of D at 1-a. If any of the inputs change, the number of samples that result in the correct curve changes.



Statistical Assumptions
The assumptions associated with the formulas for computing the number of samples are:

1. the data originate from a symmetric (but not necessarily normal) population,
2. the variance estimate, S^2, is reasonable and representative of the population being sampled,
3. the population values are not spatially or temporally correlated, and
4. the sampling locations will be selected randomly.

The first three assumptions will be assessed in a post data collection analysis. The last assumption is valid because the sample locations were selected using a random process.

Sensitivity Analysis
The sensitivity of the calculation of number of samples was explored by varying s, LBGR, b and a and examining the resulting changes in the number of samples. The following table shows the results of this analysis.

Number of Samples							
AL=10		a=5		a=10		a=15	
		s=6	s=3	s=6	s=3	s=6	s=3
LBGR=90	b=5	454	115	359	91	301	76
	b=10	360	91	276	70	226	57
	b=15	302	77	226	58	181	46
LBGR=80	b=5	115	30	91	24	76	20
	b=10	91	24	70	19	57	15
	b=15	77	21	58	15	46	12
LBGR=70	b=5	52	15	41	11	34	9
	b=10	42	12	32	9	26	7
	b=15	35	10	26	8	21	6

s = Standard Deviation
LBGR = Lower Bound of Gray Region (% of Action Level)
b = Beta (%), Probability of mistakenly concluding that m > action level
a = Alpha (%), Probability of mistakenly concluding that m < action level
AL = Action Level (Threshold)

Cost of Sampling
The total cost of the completed sampling program depends on several cost inputs, some of which are fixed, and others that are based on the number of samples collected and measured. Based on the numbers of samples determined above, the estimated total cost of sampling and analysis at this site is $3500.00, which averages out to a per sample cost of $700.00. The following table summarizes the inputs and resulting cost estimates.

COST INFORMATION			
Cost Details	**Per Analysis**	**Per Sample**	**5 Samples**
Field collection costs		$100.00	$500.00
Analytical costs	$400.00	$400.00	$2000.00
Sum of Field & Analytical costs		**$500.00**	**$2500.00**
Fixed planning and validation costs			$1000.00
Total cost			**$3500.00**

Recommended Data Analysis Activities

Post data collection activities generally follow those outlined in EPA's Guidance for Data Quality Assessment (EPA, 2000). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

Because the primary objective for sampling for this site is to compare the site median(mean) value with a threshold value, the data will be assessed in this context. Assuming the data are adequate, at least one statistical test will be done to perform a comparison between the data and the threshold of interest. Results of the exploratory and quantitative assessments of the data will be reported, along with conclusions that may be supported by them.

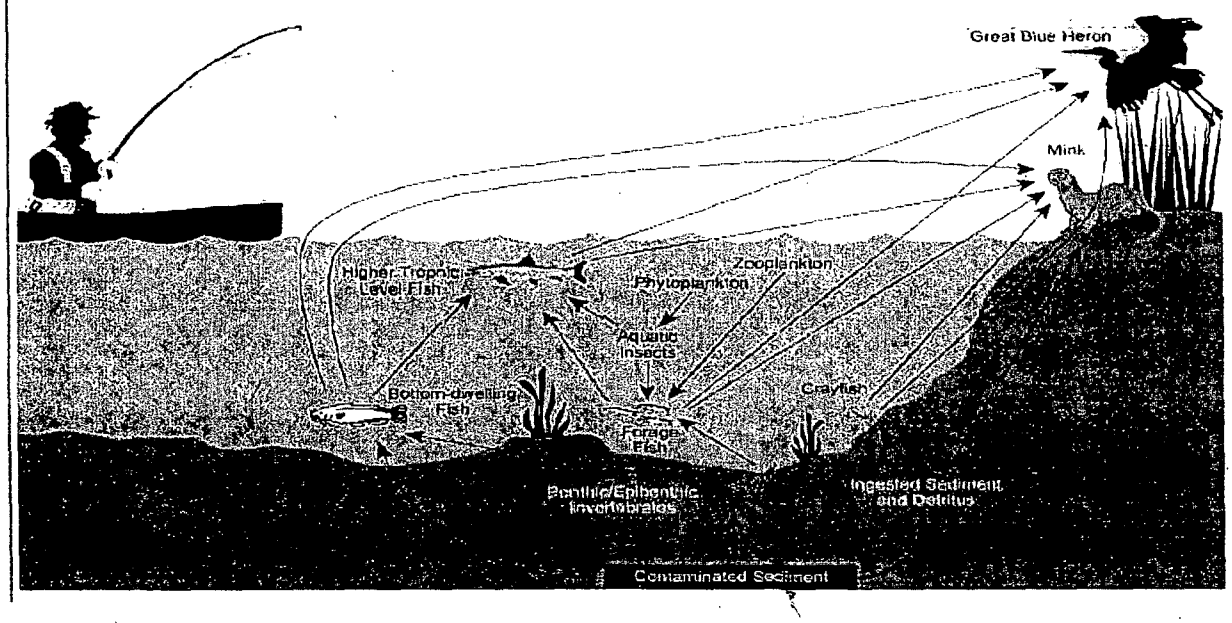
Appendix B

Example Schematic Ecological Conceptual Site Model

APPENDIX B

Example Schematic Ecological Conceptual Site Model

Highlight 2-3: Sample Pictorial-Style Conceptual Site Model Focusing on Human and Ecological Threats

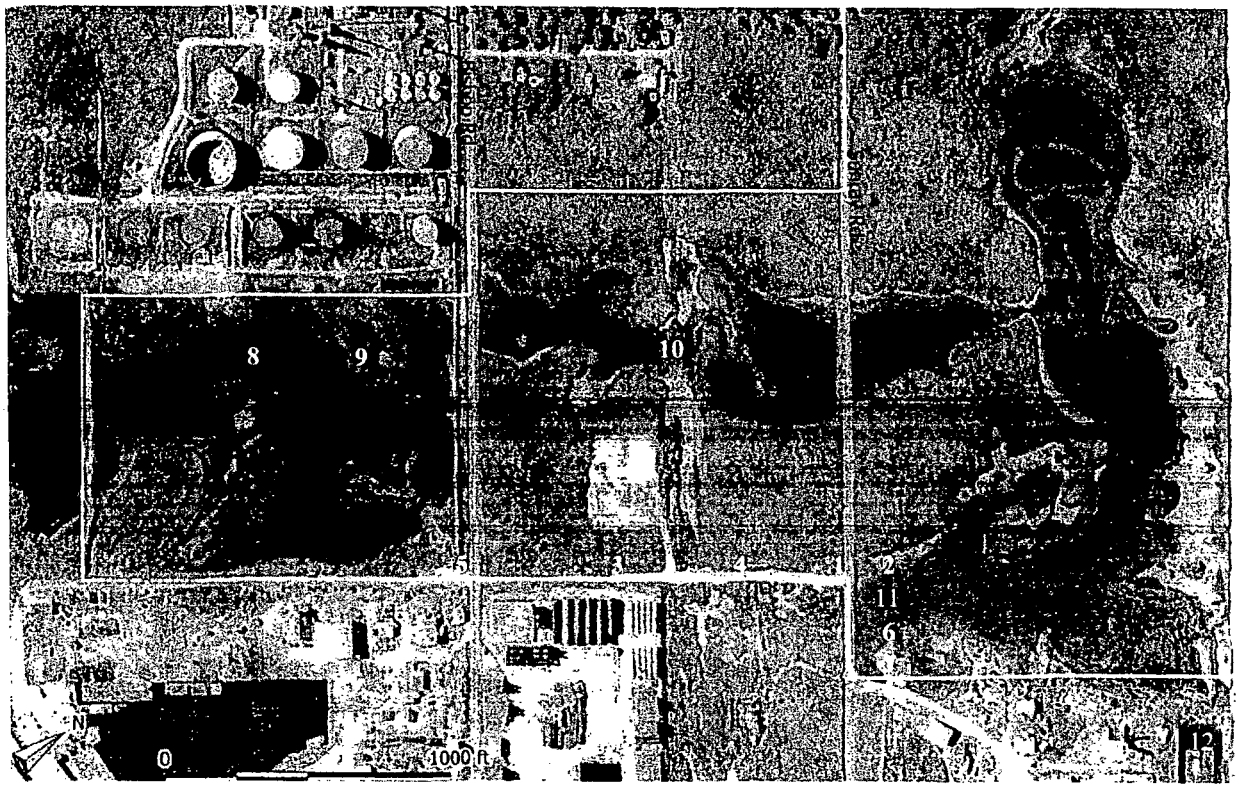


Appendix C

Additional and Revised Judgmental Sampling Locations

APPENDIX C

Additional and Revised Judgmental Sampling Locations



Soil/Sediment Sampling Locations:

1 - Location of 2006 Pipeline Cut (based on the EPA's observations)
2 - Location of 2002 Pipeline Cut (based on the EPA's observations)
3 - J-47SD, Location of 2002 MJP Pipeline Spill (based on Fig. 13 of Draft RI/FS Work Plan)
4 - J-48SD, Location of Buried Pipelines
5 - Location of 2006 Pipeline Cut (based on the EPA's observations)
6 - Location of 2002 and 2006 Chemical Seepage Area (based on the EPA's observations)
7 - Location of 2002 Pipeline Cut (based on the EPA's observations)

Sediment/Surface Water Sampling Locations:

8 - Location of Wetlands (Immediately Southeast of the Refinery)
9 - Location of Wetlands (Immediately Southeast of the Refinery)
10 - Location of Plains Marketing's Buried Pipeline in Wetlands
11 - Location of Buried Pipelines in Wetlands
12 - Location Near Intracoastal Canal (Culvert Drainage Outlet)